United States Environmental Protection Agency Region III
Corrective Action Program

ENVIRONMENTAL INDICATOR INSPECTION REPORT

Former Union Switch & Signal Division
1789 Braddock Avenue
Pittsburgh, Pennsylvania 15218
EPA ID # PAD 000001115

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GLOSSARY OF ACRONYMS

AOC	Area of Concern
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
DELCORA	Delaware Regional Water Quality Control Authority
EI	Environmental Indicator
GPD	Gallons per Day
NHD	National Hydrology Dataset
NOV	Notice of Violation
ODC	Oxford Development Company
PUDC	Parkway Union Development Corporation
PADEP	Pennsylvania Department of Environmental Protection
PADER	Pennsylvania Department of Environmental Resources
PAGWIS	Pennsylvania Groundwater Information System
PAR	Preliminary Assessment Report
RCRA	Resource Conservation and Recovery Act
SWRO	Southwest Regional Office (PADEP)
SOW	Scope of Work
SWMU	Solid Waste Management Unit
TSD	Treatment, Storage, and Disposal facilities
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
USSD	Union Switch & Signal Division
WPJWA	Wilkensburg-Penn Joint Waste Authority

DISCLAIMER

This Draft Environmental Indicator Inspection Report for the former Union Switch & Signal Division is a draft document and is not to be used as the basis for final design, construction or remedial action, or as a basis for major capital decisions. Comments to the draft will be incorporated into a final version of this report. Background/historical information and other data, which URS has used in preparing this report, have been furnished by the United States Environmental Protection Agency, Pennsylvania Department of Environmental Protection, and/or third parties. URS has relied on this information as furnished, and is neither responsible for, nor has confirmed, the accuracy of all of the historical information. This report is based on data, site conditions, and other information collected from July through January 2009, and the conclusions and recommendations herein are therefore applicable to that time frame.

1.0 INTRODUCTION

The United States Environmental Protection Agency's (USEPA's) Land and Chemicals Division, Office of Resource Conservation and Recovery Act (RCRA) Programs previously used the voluntary corrective action program for hazardous waste management facilities under USEPA Permits/Orders. This program was recently expanded to address low and medium priority facilities in Region III, which includes facilities that may not be under USEPA or Pennsylvania Department of Environmental Protection (PADEP) Permits/Orders. Voluntary corrective action program objectives are similar to corrective action program objectives for facilities under USEPA/PADEP Permits/Orders.

URS Corporation (URS) was contracted by PADEP to gather relevant information in order to determine whether human exposures to Site-specific wastes and/or groundwater releases have been controlled through interim measures or through State-ordered final remedies for several unaddressed medium/low priority facilities in Region III, including the Union Switch & Signal Division (USSD) facility. The USSD facility was located at 1789 Braddock Avenue in Pittsburgh, Pennsylvania (**Figure 1**). The USSD facility operations were previously assessed by NUS Corporation as part of USEPA Contract No. 68-01-7346 in 1989. The resulting Environmental Priorities Initiative Preliminary Assessment Report (PAR) was produced by NUS in accordance with Technical Directive Document No. F3-8903-69[71].

For this scope of work (SOW), URS assembled pertinent information to aid the USEPA and PADEP in evaluating the nature and extent of releases of hazardous wastes, evaluate facility and site characteristics, and comment on the selected corrective action measure or measures to be employed at the facility to protect human health and the environment. This report was prepared to document the work conducted by URS.

1.1 Regulatory Agency File Reviews

URS conducted an extensive records search at the PADEP South Western Regional Office (SWRO); results of which include a scanned library of PADEP documents, which is provided on compact disc in **Appendix A**. In addition, records acquired from the USEPA Region III Philadelphia Office via PADEP were reviewed. Pertinent documents were photocopied or scanned and have been retained in URS' files, but at USEPA's request have not been included in this report. A list of documents reviewed is presented in **Appendix A** and references to these documents are noted (via superscript text) throughout this report. A summary of the information obtained from these documents is presented in **Section 2.3**.

1.2 Site Visit

A site visit was conducted by URS on November 6, 2008, at the former USSD facility. Participants of the site visit included representatives from PADEP, Oxford Development Corporation (ODC), MELE Mechanical and URS. The names of the participants are listed in **Table 1**. URS and PADEP presented the facility representatives with information regarding the USEPA Region III Corrective Action process, the Environmental Indicator (EI) Assessment Program, and the legislation driving this program. URS provided the facility representative with a synopsis of the information collected from the regulatory agencies, while facility representatives provided PADEP and URS with a tour of the Site, focusing on the areas of concern (AOCs) and the areas where the solid waste management units (SWMUs) had been located that were identified in the PAR[71] (**Figure 2**). Photographs were taken with permission

of the facility representative and are provided in **Appendix B**. A current site layout is presented as **Figure 3**. During the site visit PADEP and URS met with Ms. Debbie Blaner of ODC at the Edgewood Towne Centre Office Building which was the original office building for USSD. A detailed discussion of the Edgewood Towne Centre Office Building is presented in **Section 2.3.4**. As part of the 1992 building renovation, a cooling tower was installed south of the building for the electric heat pump system which was observed during the site visit. During the site meeting, URS obtained several Phase I environmental site assessment (ESA) documents for the Edgewood Towne Centre Office Building and received possible USSD contact information. Utility information was determined and site history was discussed. URS did not tour the building.

Following the ODC meeting, PADEP and URS met with Mr. Arthur (Woody) Becker and Mr. John Madigan of MELE Mechanical, LLC who manage the Edgewood Town Centre for Phillips Edison. Mr. Becker indicated that there are four service bays for the mall area and Applebee's restaurant. Two electrical power transformers are located between the strip mall and the railroad tracks. A maintenance map for the mall was provided and the utility providers confirmed. Phillips Edison owns and maintains the mall areas and the parking lots adjacent to the mall buildings. Mr. Madigan grew up in the area and remembered that there used to be another road from USSD down to the Parkway. He also indicated that the upper parking lot at the northwest end of the property had been built up with possible onsite debris prior to final grading and paving. Edgewood Borough owns the upper parking lot and undeveloped land below the hill. Mr. Becker and Mr. Madigan confirmed that the Edgewood Town Centre Mall is in the Borough of Edgewood and the Towne Centre Office Building is in the Borough of Swissvale.

PADEP and URS walked around the upper parking lot area and in the undeveloped land west of the upper parking lot. The following two different soil types were observed in the undeveloped land west of the parking lot: 1) black to dark grey fill material containing gravel and asphalt fragments (**Appendix B, Photograph 9**) and 2) light brown sand and silt, poorly sorted with some gravel (**Appendix B, Photograph 10**). A dry drainage ditch exists below the upper parking lot along with two vertical, unused light poles in the brush north of the drainage ditch indicating a possible former access road. The SWMUs 1 through 5 identified in the PAR and presented in **Section 3.0** were not observed to be present at the time of URS' site visit.

2.0 SITE SETTING AND HISTORY

2.1 Site Setting

The USSD facility was situated on a triangular, 40-acre property in the Boroughs of Swissvale and Edgewood in Allegheny County, Pennsylvania and can be located on the United States Geological Survey (USGS) Pittsburgh East, Pennsylvania 7.5-minute Topographic Quadrangle at 79º 53' 22" west longitude and 40º 25' 35" north latitude (**Figure 1**). The USSD site is bordered to the north by the Parkway East (I-376), by Braddock Avenue to the southwest and by Conrail railroad tracks to the southeast. Beyond the railroad tracks are Edgewood Avenue and the Green Belt. Land use in the surrounding area appears to be mainly retail and residential as indicated by the topographic map. Swissvale has an estimated population of 8,830 residents (Source: United States Census Bureau, 2007). The Borough of Edgewood is located northeast of the former facility and has a population of 3,000 residents (Source: United States Census Bureau, 2007). The site is located in a populated, residential area, approximately one mile north of the Monongahela River. The operating facilities were located on a plateau along the western portion of the property. An area used for employee parking was located in the western portion of the site approximately 60 feet below the facility.

Access to the former facility location is via Braddock Avenue. The former USSD facility was located where the Towne Centre Office Building and Edgewood Towne Centre shopping complex now stand.

2.2 Site Background

George Westinghouse founded USSD in 1881, consolidating the assets of companies that had pioneered closed track circuits and interlockings. The 40 acre property was formed through the purchase of several private properties[71]. Operating as an independent company until 1917, USSD became a subsidiary of Westinghouse Air Brake. In 1968, American Standard purchased the entire operation and reorganized USSD as a separate division (Source: Wikipedia, 2008). According to information presented in the PAR, the triangular-shaped site consisted of 13 buildings including a metal plating facility, a water treatment facility and a spray booth building (**Figure 2**). A hazardous waste storage pad was located west of Building #56. On October 15, 1985, a final Closure Plan was submitted by USSD to PADER[36]. URS was unable to locate a complete copy of the Closure Plan. The expected inventory of drums in the storage area at the time of closure was as follows:

Waste Code	Description	Characteristic	# of Drums	Gallons
F001	Spent Halogenated solvent & sludge	Toxic	5	275
F006	Electroplating Wastewater sludge	Toxic	6	330
F007	Plating solution of electroplating	Reactive, toxic	6	330
F008	Plating sludge of electroplating	Reactive, toxic	4	220
F009	Strip solution of electroplating	Reactive, toxic	4	220
F011	Salt bath solution of metal treating	Reactive, toxic	37	1,110
D008	Lead	EP Toxic (Pb)	12	660
D007	Chromium	EP Toxic (Cr)	-	

Waste Code	Description	Characteristic	# of Drums	Gallons
D001	Characteristic of Ignitability	Ignitable	2	110
D000		Corrosive	2	110
*		Other	2	110
		Total	**80**	**3,475**

* "Other" category may include off-spec commercial products such as U002 (acetone), U188 (phenol), U228 (trichloroethylene), U239 (xylene), U159 (methyl ethyl ketone), P106 (sodium cyanide)

Public notice of the plan with the request of public comment was issued on December 10, 1985[41]. The Plan was approved by PADER on February 24, 1987[50] pending the following:

1. Use of water containing a detergent for cleaning of the pad rather than a mild solvent.

2. Rinsate collected after the pressure washing supplemented with scrubbing with a stiff broom will have the volume reported and be analyzed for the following constituents using the method and detection limit presented:

Parameter	Method Number	Detection Level
pH	150.1	Report in tenths of a unit
Cyanide	335.21, 335.2	At least 0.02 mg/l[1]
Cadmium	2.13.1	Less than 0.002 mg/l
Chromium	218.1, 218.2, 218.3	Less than 0.01 mg/l
Lead	239.1, 239.2	Less than 0.01 mg/l
TOC	415.1	If the detection limit is greater than 50 ppm[2] the organic constituent must be characterized
TOX	EPA SW-846 Method 9020	If the detection limits are greater than 20 ppb[3] the halogenated organic constituents must be characterized

(1) mg/l = milligram per liter
(2) ppm = parts per million
(3) ppb = parts per billion

3. Based on the results of soil analyses previously submitted in the Closure Plan, soil sampling at closure will not be required. (URS was unable to locate the soil analytical results submitted with the Closure Plan and referred to in this statement).

Building demolition and site cleanup occurred in 1987 following the approval of the Closure Plan. While the Closure Plan presents procedures for the closing of the Hazardous Waste Storage Area (SWMU #5) and the Water Treatment Facility (SWMU #4) with the collection and analysis of samples at each location, only two sets of analytical results were revealed to URS. Analytical results for the rinsate collected during closing procedures indicated TOX values greater than 20 ppb in two samples (57 ppb and 74 ppb)[54]. Based on these elevated TOX results, the halogenated constituents should be characterized for these samples (see previous table). Possible reasons for the elevated levels were elevated chlorination levels in the Wilkinsburg-Penn Joint Water Authority (WPJWA) water supply or the presence of trace halogenated organics in the WPJWA water supply. USSD requested that the elevated TOX values be accepted without further characterization and PADER agreed[56].

Following the closure of the USSD operations, the property was purchased by Parkway Union Development Corporation (PUDC) in January 1988 and the site was redeveloped[72]. The PAR states that "on December 31 1987, the USSD facility was officially closed and ownership was transferred to the Oxford Development Company (ODC)". However, tax records indicate PUDC as the property owner. It is URS's understanding that ODC developed and managed the property.

Most of the USSD buildings were removed and the Edgewood Towne Centre shopping was erected. During the decommissioning of the USSD site in 1987 and the construction of the Edgewood Towne Centre in 1988, 37 underground storage tanks (USTs) were removed[72]. Removal of these tanks occurred prior to the PADER UST program that became effective in August 1989; therefore, no UST closure documents were filed. A PADER facility inspection on December 7, 1987 states "the hazardous waste storage pad was clean and that no violations were noted during the inspection"[58,59]. PADER letter indicating closure of the storage and container unit was issued on December 31, 1987[60,61]. A PADER Site Ranking Document indicates that the site was cleaned up and closed on December 30, 1987[73]. At the time of the NUS FIT 3 site inspection in May 1989, demolition was occurring on-site and site access was restricted to the surrounding fence line. Demolition of building No. 9 was completed with most of Building Nos. 4 and 10 being demolished. No evidence of the hazardous waste storage pad was observed and numerous debris piles were scattered throughout the property[71].

Review of a 1983 USSD topographic map and the PADEP eMap program indicates the presence of five decommissioned oil and gas wells on the property (**Figure 3**)[13]. According to eMap, these wells are owned by AS Energy Inc. and have been plugged. Four of these wells have the facility name of Westinghouse Air Brake Company while one has a Union Switch & Signal facility name. Evidence of these wells was not observed by URS during the site visit. Research regarding installation, production rates, and closure of these wells are outside the scope of this investigation.

2.3 Operational History, Including Wastes Generated and Their Management

2.3.1 Former Operations

From 1880 until 1987, the Site was the location of operations for USSD. USSD is a major producer of various electrical and mechanical components used in railroad signaling and control systems. Operations at the Swissvale facility included the heat treatment of metal parts (for stress relief and case hardening) and painting of finished products in four spray paint booths [71]. Also several types of electroplating processes were practiced, utilizing different plating baths, depending on the type of material required. A water-treatment plant was used by USSD for the treatment of rinse waters and a portion of the special bath material generated during plating operations. Types of wastes generated and the estimated annual volume generated is presented in **Table 3**.

2.3.2 Permitting

In November 1980, USSD (PAD000001115) filed a Notification of Hazardous Waste Activity and submitted a Part A Hazardous Waste Permit Application for generation and treatment, storage, or disposal (TSD) [4]. Existing environmental permits issued by Allegheny County at the time of the Part A permit application included:

Permit 7055004 000 00505 Gas Fired Boiler
Permit 7055004 000 00506 Coal/Gas Fired Boiler
Permit 7055004 000 65901 Grinding Area Dust Collector

The PAR states that an amended Notification of Hazardous Waste Activity and a Part A Permit Application were submitted in June 1982 identifying increased hazardous waste generation[11]. A list of permitted hazardous wastes is presented in **Table 2**. The facility submitted a Part B Permit Application to PADER on August 29, 1983[16]. USSD decided to close the hazardous waste storage facility (a concrete drum storage pad) and filed a closure plan in October 1985[71]. Consequently, PADER returned the Part B Permit application to USSD and the permit was never filed[40].

Information in USEPA Envirofacts website and the Right-to-Know Network website indicates a second facility identification code, PAD 065610834, issued to USSD in April 1985 as a Transporter and Small Quantity Generator (SQG). However, a PADER memo in the file states the new identification number was issued in error[34].

USSD submitted a closure certification to PADER for the concrete drum storage pad in November 1987[56,57]. PADER performed a site inspection on December 7, 1987 which stated that the storage pad had been adequately closed pending completion of manifest information (PAB467H66 dated 10/7/87)[58]. Acknowledgement of receipt of that manifest information was not located by URS in the file. Other permits not located by URS during the file review process were an air permit for the paint booths (SWMU#1) and a National Pollutant Discharge Elimination System (NPDES) discharge permit for the wastewater treatment facility (SWMU#4) located onsite (see **Section 3.0**). The USSD facility is not identified in the PADEP eFacts website.

2.3.3 Inspections

The first facility inspection by PADER occurred on September 19, 1980 due to a worker complaint about dumping of machine oil outside the exit door onto the ground, dumping of oil into a sludge pit, and draining wash tools waste into normal drains[2,3]. A detailed review of available files indicates that regular hazardous waste inspections were conducted at the facility in 1984, 1985, and 1986 (Source: EPA and PADEP files, 2008)[22,29,43](**Table 3**). Notice of Violations (NOV) were reported for the 1984 inspection of the former facility. A follow-up inspection on July 23, 1984 indicated several of the previous violations had been abated, but that one Level 1 violation and two Level 3 violations were observed. USSD was given until August 10, 1984 to address the remaining violations. By December 10, 1984 all violations from both the June 27 and July 23, 1984 inspections had been addressed[25,26,27,28]. The January 16, 1985 inspection resulted in two NOVs that were resolved in March 1985[31,33]. The July 1986 inspection resulted in a manifest violation that was resolved. No NOV was issued[43,44]. A General Inspection was performed by PADER in December 1987 during which the storage pad was deemed ”clean” and no violations were noted. A final PADER inspection performed in August 1989 stated that all buildings on the site had been removed with the exception of Building No. 28 adjacent to Braddock Avenue. A footnote on the inspection report states that the “department has not sampled soils, surface/groundwater from the facility”[69].

A citizen complaint is indicated by a July 1989 PADEP letter[68]. No follow-up to this complaint

was located in the file. ODC has control of the facility with future plans to build a shopping mall and develop a commercial enterprise zone[69].

2.3.4 Current Operational Information

Following site development, the former USSD property was subdivided and is currently owned by three different entities: PUDC (the Towne Centre Office building), Phillips Edison Corporation (the Edgewood Towne Centre shopping center) and the Borough of Edgewood (parking lot and undeveloped area)(**Figure 4**). Utilities to the properties are supplied as follows: water by the WPJWA, power by Dusquene Light, and natural gas by Dominion Peoples. According to site personnel, sanitation/stormwater drainage services are provided by Swissvale for the Town Centre Office building and Wilkensburg for the Edgewood Towne Centre shopping center. There are no USTs onsite. A discussion of different tracts by property owner is presented below:

Parkway Union Development Corporation: The Parkway Union Development Corporation owns 2.265 acres of the original USSD property on which the 78,000 square foot Towne Centre Office Building (TCOB) is located[72]. Allegheny County Real Estate records indicate PUDC purchased the property in January 1988. The TCOB is a five-story structure formerly known as USSD Building 28. This building was erected to house administrative offices, an employee cafeteria and a secured storage area in 1927 by the Westinghouse Airbrake Company on ground previously occupied by a machine shop and guard house[72]. During the site visit, Ms. Debbie Blaner of ODC indicated that the original vaults are still present in the basement. The use of these vaults was not discussed during the site visit. Asbestos was removed from the building in 1990 and a complete building renovation was performed in 1992 including the installation of a large cooling tower south of the building. In November and December 1995, two rounds of radon testing were performed in the basement. Radon concentrations ranged from 6.7 to 17.3 pCi/l with an average value of 10.6 pCi/l for 12 indoor air samples. Site personnel indicated that no radon ventilation system was present in the basement at the time of the site visit. A 1992 Phase I Report states that historical maps suggest the former presence of a gas supply well on or near the northernmost portion of the property[72]. The presence of this former gas supply well was confirmed using eFacts (**Figure 3**).

The building is currently managed by Oxford Development Corporation (ODC). The current list of tenants includes Allegheny Chesapeake, American General-AIG, Apple America Group, Bayada Nurses, Construction General Labors-Local #3373, Cricket Communications, Community Hearing, Dr. James Gleason/UPMC, Edgewood Dental Associates, Dr. Norman Feldstein DDS, Five Season Painters, Hold Family Institute, HPW Associates, Hyland Investments and Insurance, Interim Health Care of Pittsburgh, Inc. Alion Science, Robert Lebovits Ph.D., Karl E. Osterhout, Myers & Moidel P.C., Palko & Lessman O.D., Pittsburgh Critical Care Associates, PSI, Dr. Deborah Rotenstein, Sprint PCS, Venturi Staffing Partners, and Western PA Foot & Ankle.

Phillips Edison Corporation: Phillips Edison Corporation purchased the Edgewood Towne Centre shopping center in October 2004 from Parkway Union Development Corporation. The approximately 340,000 square foot shopping center located on approximately 30 acres contains many retail shops and several restaurants. The following is a partial list of current vendors: Giant Eagle grocery store, Kmart, A.J. Wright, Dollar Tree, Wine & Spirits, Super Nails, Foot Locker, Ashley Stewart's, Dot's Fashions, Citizens Bank, National City Bank, Super Nails, Applebees, Taco Bell, Eat'n Park, Fox's Pizza, The Laundry Room and Hook Fish & Chicken.

During the site visit, PADEP and URS met with Mr. Arthur (Woody) Becker and Mr. John Madigan of MELE Mechanical, LLC who manage the Edgewood Town Centre for Phillips Edison.

Borough of Edgewood: According to personnel interviewed during the site visit, the Borough of Edgewood owns the parking lot northwest of the Hook Fish & Chicken Restaurant and the undeveloped land between the parking lot and I-376. Allegheny County Real Estate records indicate this 7.36 acres parcel was obtained by the Borough in October 1993.

The final correspondence to PADEP for this site occurred in 1996 when SE Technologies was retained to conduct a Phase I ESA and wrote to PADEP about the former USSD facility's CERCLIS status. PADEP's response was that site was currently on the "NFRAP List"(no further remedial action planned) and is slated to be removed from the list [75,76]. URS did not locate any documentation indicating action regarding the former USSD site and removal from the NFRAP List.

An overlay of the current site map with the historic site map is presented in **Figure 5**. Please note that these drawings are not to scale and locations of past and present buildings is approximate.

3.0 DESCRIPTION OF SWMUs/AOCs AND KNOWN OR POTENTIAL RELEASES

A PAR for the facility was issued on October 24 1989, following a May 18, 1989, site visit by NUS personnel[71]. In this report, the following five SWMUs were identified: the four spray paint booths, the metal-plating facility, the heat-treatment facility, the wastewater-treatment facility, and the hazardous waste storage pad (**Figure 2**). A summary of that presented in the PAR for these SWMUs is presented within this section. Updated information relative to these SWMUs, and URS' observations of the former locations of the SWMUs viewed during our September 2008 site visit are presented in the photographs in **Appendix B**, and as discussed in **Section 1.2** (i.e SWMUs 1 through 5 are no longer present).

SWMU #1 – Four Spray Paint Booths: Four spray paint booths were used by USSD to paint products prior to shipment. The booths were located in Building No. 4 and were designed to collect overspray. Oversprayed paint contacted with the walls of the booths or a water curtain that ran down one wall. The walls were covered with a plastic film that could be removed and replaced. The water curtain drained to a 600-gallon tank containing flocculant to precipitate paint suspended in the water. Water from the tank was recycled and the paint sludge was removed and place in 55-gallon drums for disposal. Approximately 30 drums of waste paint sludge (D007) were generated per year. Approximately eight drums of paint residue (D001 and D007) laden with lead and small amounts of xylene were generated each year through the cleaning of spray guns and other painting equipment. Also, another four drums per year were used for the disposal of air filters (holding leaded paint) from the paint booths. The paint booths were constructed of concrete and were vented by a filtered exhaust fan. Available information indicates that the spray paint booths began operation in approximately 1970 and ceased operation in July 1987. According to the NUS report, no releases are known to have occurred in this area[71].

SWMU #2 – Metal-Plating Facility: Plating operations occurred in Building No. 8 which has concrete floors and walls. Steel, aluminum, brass, copper, and bronze were the materials that were plated for use in various electrical and mechanical components of railroad signaling and control systems. The parts were cleaned before the plating process using an alkaline base wash in conjunction with sulfuric and muriatic acids. Trichloroethene (TCE) was used as a degreasing agent. Several types of electroplating were used at the facility. Different plating baths were used according to the type of material needed. All bath types contained high level of metals, including chromium, cadmium, copper, zinc, and aluminum. The contaminated cleaning rinse water was treated at the site's water treatment plant, along with a portion of the spent bath material. Plating bath sludges, along with spent TCE, were drummed and held at the hazardous waste storage pad prior to disposal.

The metal-plating facility generated approximately 55-gallon drums of waste per year. This waste included approximately 24 drums of sludge from the treatment of cleansing water at the water treatment plant (F006). Another 25 drums of waste included the portion of the spent bath material (F007) that was not discharged into the water treatment plant. In addition, approximately six drums of plating bath sludge (F009) were generated each year. All waste generated at the plating facility were stored in 55-gallon drums on the hazardous waste storage pad. Any spills were confined to the immediate area. According to the NUS report, no releases are known to have occurred in this area[71]. Available information indicates that the metal plating facility began operations in approximately the mid-1960s and ceased operating in July 1987.

Prior to November 1980, a Hazardous Waste Storage Area measuring 28 feet by 45 feet was located east of Building No. 8[4]. Hazardous waste storage was relocated to the western side of Building No. 56 by the end of 1980. According to the Part A Permit application, the new hazardous waste storage area consisted of a concrete pad, curbing, and fencing.

SWMU #3 – Heat-Treatment Facility: Heat-treating operations were conducted in Building No. 56. Treating was performed for a variety of purposes (including stress relief and case hardening) on various carbon steels. The metals were subjected to a sodium cyanide heat-treatment bath during the process. Approximately forty 30-gallon drums per year of 10 to 15 percent spent sodium cyanide (F011 and D003) solution were generated during the heat treatment of carbon steels. The wastes were stored at the hazardous waste storage pad prior to disposal. Available information indicates that this facility started operating in the 1960s and ceased operations in July 1987. According to the NUS report, no releases have been documented for this facility[71].

SWMU #4 – Wastewater-Treatment Facility: The wastewater-treatment facility was located in Building No. 9 and treated rinsewaters from the metal-plating operations and a portion of the spent plating bath material. Streams from the metal-plating rinse were divided into cyanide and noncyanide-bearing segments. The cyanide-bearing water entered a cyanide-destruction system where an oxidation-reduction reaction was initiated. The effluent from this area was mixed with noncyanide stream and pumped to a pH adjustment tank where a pH of 9 was maintained. The water then entered a clarifier where a flocculant was added to induce the settling of suspended solids. The resulting sludge was pumped from the bottom of the clarifier to a filter press where it was dewatered. The dewatered sludge (filter cake) was deposited in 55-gallon drums, sealed, and held at the hazardous waste storage pad prior to disposal. Approximately 24 drums of the RCRA-classified hazardous waste F006 (metal hydroxide filter cake) was generated per year. The water-treatment facility contained a concrete floor with floor drains that retuned any over flow to the original waste stream entering the treatment process. Treated water was discharged to the Allegheny County Sanitary Sewer System. Available information indicates the wastewater treatment unit began operation in the late 1970s and ceased operations in July 1987. According to the NUS report, no releases have been documented for this facility[71].

SWMU #5 – Hazardous Waste Storage Pad: The hazardous waste storage pad was a 1,950-square foot concrete pad located west of Building No. 56 used to store all drummed hazardous waste generated by USSD. The pad was divided into three sections: 1) storage of acid wastes, 2) storage of caustic and cyanide wastes, and 3) storage of other wastes. Each section had a separate drainage sump to collect any spilled material. A fence surrounded the storage area to prevent unauthorized access. Shipments of waste from the storage pad occurred three to five times per year, depending on production schedules.

The storage pad was used for the storage of all waste generated at the facility prior to disposal, which included paint booth waste (D001, D007, D008), metal-plating wastes (F006, F007, F008, F009), metal heat treatment wastes (D003, F011), spent TCE (F001) and small amounts of battery acid (D002) from vehicles used on site. All hazardous wastes were stored in drums on wooden pallets. The storage pad was constructed of 12 inch-thick reinforced concrete surrounded by a 6-inch-wide curb ranging in height from 1.5 inches along the northern edge to 8 inches along the sump area. Six-inch-wide concrete berms separated the three waste storage areas. The surface slope of the pad was designed to direct all drainage southwestwardly to three sump pits. The entire area was enclosed by an eight-foot chain-link fence. Available

information indicates that the pad was constructed in 1981 and closed with PADER approval in December 1987 [60,61]. According to the NUS report, no releases are known to have occurred in this area[71].

4.0 DESCRIPTION OF EXPOSURE PATHWAYS FOR ALL RELEASES OR POTENTIAL RELEASES

4.1 Air

Exposure pathways to air can occur due to the presence of contaminants in both outdoor air and indoor air. A detailed discussion of the releases associated with both of these pathways for the USSD facility is presented below.

4.1.1 Outdoor Air

The former USSD site is an inactive facility that was used for the production of electrical and mechanical components for railroad signaling and switching systems that operated from approximately 1880 until 1987. Exhaust fans in the process areas and the paint booths once existed at the facility and were discussed in the PAR. Air emission stacks were observed in photographs of the metal plating facility taken during the NUS May 1989 site visit. Site processes were terminated in July 1987, and site demolition occurred in 1988 and 1989, which removed the exhaust fans paint booths, and stacks. Because of the termination of USSD site activity, there is no current exposure pathway or potential for release to outdoor air from this former facility.

4.1.2 Indoor Air

To evaluate potential risks to indoor air quality at a Site, results of groundwater or soil chemical data collected during the demolition and remediation of the Site are screened against current USEPA-PA default residential volatilization to indoor air screening values as published in PADEP's Guidance "Section IV.A.4 – Vapor Intrusion into Buildings from Groundwater and Soil Under the Act 2 Statewide Health Standard", effective January 24, 2004 and the assumptions made to apply the screening values. For this former USSD facility, URS was unable to adequately evaluate possible impacts to indoor air for the following reasons:

- Four former spray paint booths (SWMU #1) were located along the eastern border of the property adjacent to the existing railroad tracks. Currently, a portion of the Edgewood Towne Centre shopping mall is located within the 100 foot radius specified by USEPA and PADEP for consideration of the vapor intrusion pathway. No groundwater or soil data were available for review; therefore, the vapor intrusion to indoor air pathway could not be evaluated.

- The metal-plating facility (SWMU #2) with the original hazardous waste storage pad was located where the current Eat 'n Park restaurant now stands. No groundwater or soil data were available for review; therefore, the vapor intrusion to indoor air pathway could not be evaluated.

- The water treatment facility building (SWMU #4) was located where several current retail stores in the Edgewood Towne Centre shopping mall area located. No groundwater or soil data were available for review; therefore, the vapor intrusion to indoor air pathway could not be evaluated.

- Certificate of Closure was issued for the storage facility (SWMU #5); however, no analytical data was available for review by URS. Consequently, the vapor intrusion to indoor air pathway could not be evaluated.

- Thirty-seven (37) USTs were removed during the decommissioning of the USSD site. The contents and locations of these former tanks are unknown based on available information. Consequently, the vapor intrusion to indoor air pathway could not be evaluated.

4.2 Groundwater

Analytical results for groundwater samples, if collected, were not located by URS. According to the file review information and the knowledge of people interviewed, no groundwater monitoring wells were installed at the USSD facility. Consequently, the chemical quality and the flow direction of the groundwater beneath the Site have not been established. No known chemical releases caused by to USSD's former operations that could impact groundwater were reported at the Site. The suspected direction of shallow groundwater flow is to the south-southwest toward the Monogahela River

Research through the Pennsylvania Groundwater Well Information System (PAGWIS) website indicates that there are no groundwater wells documented within a one-mile radius of the former USSD facility. Public water is supplied by the WPJWA of Pittsburgh which serves a population of about 120,000 in the following municipalities; Wilkinsburg, Penn Hills, Swissvale, Edgewood, Churchill, Turtle Creek, Forest Hills, N. Braddock, E. Pittsburgh, Rankin, Braddock, Braddock Hills, Wilmerding, Pitcairn, Trafford, E. McKeesport, Wilkins Twp., and Chalfant (Source: Forest Hills Municipal website, 2008 and the PA Drinking Water Reporting System, 2008).

4.3 Surface Water

The nearest surface water body is Ninemile Run which is located approximately one quarter mile west of the facility. Ninemile Run flows into the Monogahela River at approximately one and a half miles southwest of the Site. The Monogahela River merges with the Allegheny River to form the Ohio River approximately five miles west of the Site.

PADEP identifies Ninemile Run as an approved Streams Integrated List Non Attain stream according to the standards set by the Pennsylvania Clean Streams Law {note, this change is also needed on page 4 of the human health EID worksheet under item 5, surface water}. These standards are based upon aquatic life, fish consumption, recreational use and potable water supply criteria (**Figure 3**). The FEMA Floodplain map indicates that the facility is outside the 500 year flood zone (**Figure 6**). URS did not observe any of the surface water bodies at the time of the November 2008 Site visit. A dry drainage ditch was noted west of the upper parking lot draining towards I-376.

4.4 Soil

According to information obtained from the USDA Natural Resources Conservation Service program, approximately 65 percent of the former USSD site is underlain by the Urban land-Rainsboro Complex (URB). Urban land comprises 75 percent of the unit while Rainsboro and similar soils equals 15 percent. The remaining 5 percent consist of minor components. Physical properties typical of this soil is moderately well drained with silt loam (0 to 40 inches) underlain with sandy clay loam (40 to 60 inches) with gravelly sandy loam beneath (60 to 72

inches) which lies on top of Quaternary age alluvial terrace deposits in some locations beneath which is the Conemaugh Group. The Conemaugh Group is present beneath the entire area but in some locations it is covered with a veneer of Quaternary terrace deposits[71]. The soil on the Site has a 0 to 3 percent slope. The Urban land-Culleoka Complex (UCD) underlies approximately 15 percent of the site. Urban land is 50 percent of the soil composition while Culleoka and similar soils are 40 percent. It has a slope of 8 to 25 percent and is well drained with channery silt loam (0 to 26 inches) with very channery silt loam (26 to 31 inches) beneath which is bedrock.

While a macadam parking lot covers a large portion of the former USSD facility and can serve as a cap in those areas, buildings have been built on top of and adjacent to former USSD SWMUs locations. Also, during the URS site visit the following two types of soil were observed in the vacant area west of the upper parking lot: 1) black to dark grey fill material containing gravel and asphalt fragments and 2) light brown sand and silt, poorly sorted with some gravel. Similar to groundwater, on-site soils have not been investigated relative to USSD's former operations. Based on information presented in this EI assessment, the collection of soil samples and their analyses would need to be conducted to determine the current existence of regulated substances in the soil at the Site.

5.0 EXPOSURE PATHWAY CONTROLS AND/OR RELEASE CONTROLS INSTITUTED AT THE FACILITY

5.1 Air

A detailed discussion of the controls associated with the outdoor and indoor air pathways at the former USSD facility is presented below.

5.1.1 Outdoor Air

As documented in **Section 4.1.1**, there may have been releases to outdoor air at the USSD facility during past operations. However, because USSD site activity was terminated in 1987, there is no current exposure pathway or potential for release to outdoor air from this facility.

5.1.2 Indoor Air

A description of the potential indoor air exposure pathway via soil vapor intrusion was provided previously in **Section 4.1.2**.

Currently, no controls on the indoor air pathways exist at the Site. It is unknown whether such controls are needed to mitigate the soil vapor/groundwater-to-indoor air pathway because the data currently available for the Site is insufficient to determine if the pathway is complete to cause potential exposures. Former areas where RCRA regulated substances were used by USSD (most SWMUs) are within 100 feet of current occupied buildings; however, no data are known to exist to characterize the extent of soil or groundwater contamination, if any, in these areas.

Further investigation of Site soils and groundwater would be necessary to determine if the vapor intrusion to indoor air pathway is complete and, if so, to dictate possible implementation of engineering and administrative controls such as vapor barriers or deed restrictions on existing buildings and future construction.

5.2 Groundwater

The impacts to groundwater quality resulting from the former USSD operations, which operated from 1880 to 1987, are unknown based on available information. Groundwater is reportedly currently not used on-site, and on-site groundwater use is not deed restricted. There are no known domestic or industrial wells within one mile of the Site. Groundwater quality and its flow gradient beneath the Site have not been established. There are no known controls to limit groundwater flow from the Site, and the need for such controls is unknown based on the available information reviewed.

5.3 Surface Water

As documented in **Section 4.3**, there are no known direct discharges from the Site to surface water, and thus, no controls for this exposure pathway are necessary. However, it is currently unknown whether the indirect groundwater discharge-to-surface water pathway is complete or, if it is, whether the diffuse groundwater discharges would results in unacceptable limits to off Site human or ecological receptors. Therefore, it is unknown if such controls on groundwater discharge to off site surface water bodies are necessary.

5.4 Soil

Because of very limited known soil information, several areas of potential soil contamination exist at the Site, primarily at the historic SWMUs.

While exposure pathway controls exist over part of the former facility in the form of a parking lot, no exposure pathways controls have been instituted in other areas of the Site. It is unknown whether such controls are warranted because the possible presence of regulated substances in soils at the historic SWMUs have not been adequately characterized.

6.0 CONCLUSIONS AND FOLLOW-UP ACTION ITEMS

Using known and available information obtained from USEPA and PADEP, there have been no reported/suspected chemical releases at the Site, nor has groundwater or soil sampling been performed within a regulatory framework. URS has completed the "Documentation of Environmental Indicator Determination, RCRA Corrective Action Environmental Indicator" checklists for RCRIS code (CA725) – Current Human Exposures Under Control and RCRIS code (CA750) – Migration of Contaminated Groundwater Under Control, indicating as such. The completed checklists are provided in **Appendix C**.

The PADEP Southwest Region and USEPA-Region III will decide if additional information or soil/groundwater characterization at the facility is required to determine whether or not the environmental indicators have been met or if Corrective Action is required by the facility.

As detailed previously, for the purposes of this report, and as verified in communications between URS and the PADEP during the site visit on November 6, 2008, the 'Site' as has been discussed herein is defined as the former Union Switch and Signal Division of American Standard facility located on Braddock Avenue in Pittsburgh, Pennsylvania. This Site housed USSD operations from 1881 until December 1987 when the facility was decommissioned and sold. URS was unable to identify and subsequently review any analytical data for soil, sediment, groundwater or surface water samples that might have been collected during the decommissioning and/or sale of the Site. Consequently "IN" status was designated for the RCRA Groundwater, Human Health and Vapor Intrusion Worksheets due to lack of data.

7.0 REFERENCES

Allegheny County, Pennsylvania Real Estate website http://www.county.allegheny.pa.us

eMapPA http://www.emappa.dep.state.pa.us/WebSite/DD_Metadata/Water/DD_Water.htm accessed August 14, 2008

Envirofacts http://oaspub.epa.gov/enviro

Forest Hills Municipal website http://www.foresthillspa.org/fhpa-index.html

PA Drinking Water Information http://www.drinkingwater.state.pa.us/dwrsbroker/broker.exe

Pennsylvania Code of Regulations Title 25 Chapter 250. June 1997, as updated in the Pennsylvania Bulletin, November 24, 2001. *Administration of Land Recycling Program and Remediation Standards Act (Act 2)*.

Pennsylvania Department of Environmental Protection. June 8, 2002. *Pennsylvania Land Recycling Program Technical Guidance Manual*, 126 p. and Appendices.

Pennsylvania Department of Environmental Protection. January 2004. *Final Guidance on Vapor Intrusion into Buildings from Groundwater and Soil under Act 2 Statewide Health Standard.*

Pennsylvania Groundwater Information System http://www.dcnr.state.pa.us/topogeo/groundwater/PaGWIS/PaGWISMenu accessed August 15, 2008

Right-to-Know Network http://www.rtknet.org/mas/fac, accessed August 15, 2008

Union Switch & Signal website: http://www.switch.com/about.html, accessed August 19, 2008

United States Census Bureau. Fact Sheet for Swissvale and Edgewood Boroughs. http://factfinder.census.gov/ servlet/SAFFFacts accessed August 15, 2008

TABLES

Table 1

Site Visit Participants
November 6, 2008
Union Switch & Signal Division Facility
Pittsburgh, Pennsylvania
PAD000001115

Person on Site	Company Represented
Carl Spadaro	Pennsylvania Department of Environmental Protection (412)442-4157 cspadaro@state.pa.us
Arthur (Woody) Becker	MELE Mechanical (412)812-2839
John Madigan	MELE Mechanical (412)351-1234 jmadigan@melemechanical.com
Debbie Blaner	Oxford Development Corporation (412)243-4405 DBlaner@oxforddevelopment.com
Brittany Austin	URS (717)635-7904 brittany_austin@urscorp.com
Rebecca Walsh	URS (717)635-7910 rebecca_walsh@urscorp.com

Table 2

EPA Hazardous Wastes Listed on Part A Permit
Union Switch & Signal Division
Pittsburgh, Pennsylvania
PAD000001115

USEPA Waste Code	Waste Description	USEPA Waste Code	Waste Description
F001	Spent halogenated solvent degreasers	F006	Sludge from electroplating operations
F007	Spent cyanide plating solutions	F008	Plating bath residues using cyanide
F009	Spent stripping & cleaning bath solutions	F011	Spent salt bath cyanide solutions
D001	Characteristic of Ignitability	D002	Characteristic of Corrosivity
D007	Chromium	D008	Lead
U002	Acetone	U188	Phenol
U228	Trichloroethylene	U239	Xylene
U159	Methyl ethyl ketone	P106	Sodium cyanide

Table 3
Wastes Generated (1983)
Union Switch and Signal Division
Pittsburgh, Pennsylvania
PAD000001115

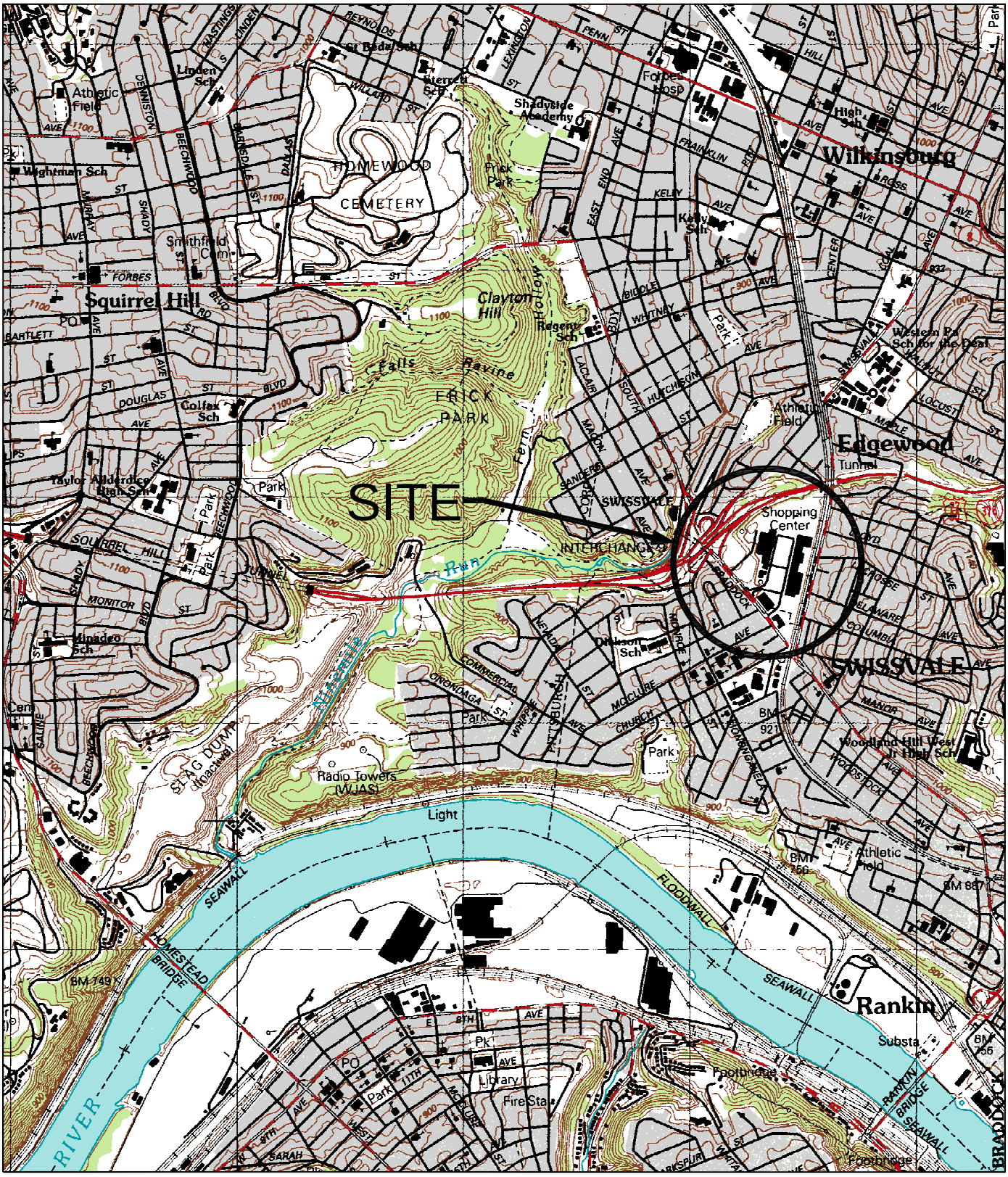
Waste Group	Waste	Waste Type	Source	Estimated Amount Generated /Year
Paint Waste	Paint Booth Sludge	D007	Paint Booths	30 drums
	Waste Paints	D007, D001	Cleanup, leftover	8 drums
	Intake & Exhaust Filters	D007, D008	Paint Booths	4 drums
Plating Waste	Filter Press Sludge	F006	Treatment of plating rinse water	24 drums
	Spent Baths	F007	Plating baths	25 drums
	Spent Stripping Baths	F008	Stripping baths	
	Bath Sludges (Copper, Brass, Cadmium, Tin)	F009	Plating baths	6 drums
Metal Heat Treat Wastes	Sodium Cyanide Salts	F001, D003	Heat Treat Tank	40 30 gallon drums
Miscellaneous Wastes	Zinc Chromate Solution	D007	Metal Cleaning	O[2]
	Battery Acids	D002	Vehicles	100 batteries
	Spent Trichloroethylene	F001, D003	Vapor degreasing	20 drums
Off-Specification Products	Acetone	U002	-	1 drum
	Phenol	U188	-	1 drum
	Trichloroethylene	U228	-	1 drum
	Xylene	U239	-	1 drum
	Methyl Ethyl Ketone	U159	-	1 drum
	Sodium Cyanide	P106	-	1 drum

Source: Part B Operating Permit Application, August 1983, Table C-1
Drums = 55-gallon steel drums

Table 4
Historic Inspection Findings
Union Switch and Signal Division
Pittsburgh, Pennsylvania
PAD000001115

Date	Appendix A Document No.	Type of Inspection	Comments
9/18/1980	2, 3	Waste Discharge Inspection	Inspection made on basis of complaint. Inspection shows that: 1) centrifuger appears to be recirculating cutting oil 2) parts washing water goes to settling basin and then ALCOSAN 3) water soluble solvents dumped outside Building #10 into ALCOSAN sewer. Recommendation: new storage area to be curbed and sumped by 11/15/80.
6/27/1984	22	Hazardous Waste Inspection	NOV - Generator - 1) Perform hazardous waste determination on wastewater/sludges 2) Proper manifest completion 3) Proper container usage and labeling 4) Submit quarterly reports TSD - 1) Develop written maintenance and inspection schedule 2) Uncovered tanks need correct freeboard or overflow alarm device 3) Continuously-fed systems must have inflow control system 4) Tank inspections must occur daily 5) Manage treatment processes/equipment to prevent leaks or failure 6) Discharge controls, safety and monitoring equipment inspected daily.
7/23/1984	24	Hazardous Waste Inspection	NOV - One Level 1 and Two Level 3 violations. Most previous violations had been addressed.
1/16/1985	29	Hazardous Waste Inspection	NOV - TSD - 1) Drum in storage area had accumulation date from 1983 and 2) Containment structure needed for above-ground hazardous waste accumulation/storage tank.
7/8/1986	43	Hazardous Waste Inspection	Proper manifest completion which was resolved.
12/7/1987	58	General Inspection	In Compliance
8/30/1989	69	General Inspection	Closed site - Demolition observed. PADEP has not sampled soils and surface/groundwater.

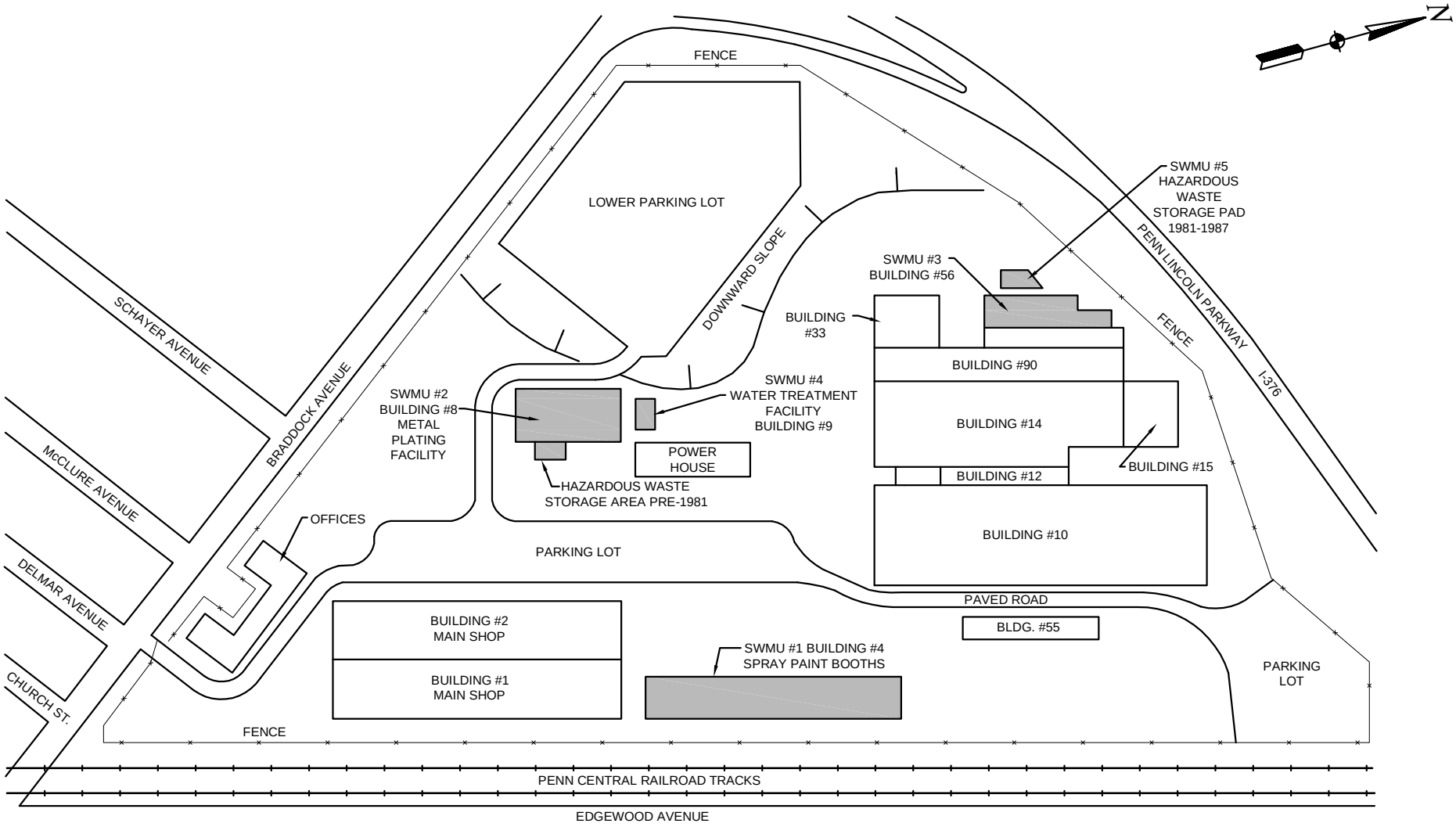
FIGURES



REFERENCE:
A Portion of USGS 7.5 Minute Topographic Map;
Pittsburgh East Quadrangle , Pennsylvania; 1993.

TITLE	SITE LOCATION MAP		
PROJECT	Union Switch & Signal Division		
URS	4507 NORTH FRONT STREET, SUITE 200 HARRISBURG, PENNSYLVANIA 17110 (717) 635-7901 FAX (717) 635-7902 www.urscorp.com		
SCALE AS SHOWN	DWN. BY AWJ	JOB NO. 20497896	
DATE 7/02/08	APPR. BY	FIG. NO. 1	

File: L:\GTAC PROJECTS\RCRA Els\2008 Els\0-304 Union Switch 20497896\DWG\UnionSwitch01-SiteLocMap.dwg Layout: 8.5x11 User: aaron_jones Nov 17, 2008 - 2:02pm



NOTE: THIS DRAWING IS NOT TO SCALE

REFERENCE:
HAZARDOUS WASTE PERMIT APPLICATION, NOVEMBER 18, 1980,
ENVIRONMENTAL PRIORITIES INITIATIVE PRELIMINARY ASSESSMENT,
NUS CORPORATION, OCTOBER 24, 1989.

TITLE	HISTORIC SITE MAP-1989
PROJECT	Union Switch & Signal Division

URS
4507 NORTH FRONT STREET, SUITE 200
HARRISBURG, PENNSYLVANIA 17110
(717) 635-7901 FAX (717) 635-7902
www.urscorp.com

SCALE	N.T.S.	DWN. BY	AWJ	JOB NO.	20497896
DATE	8/21/08	APPR. BY		FIG. NO.	2

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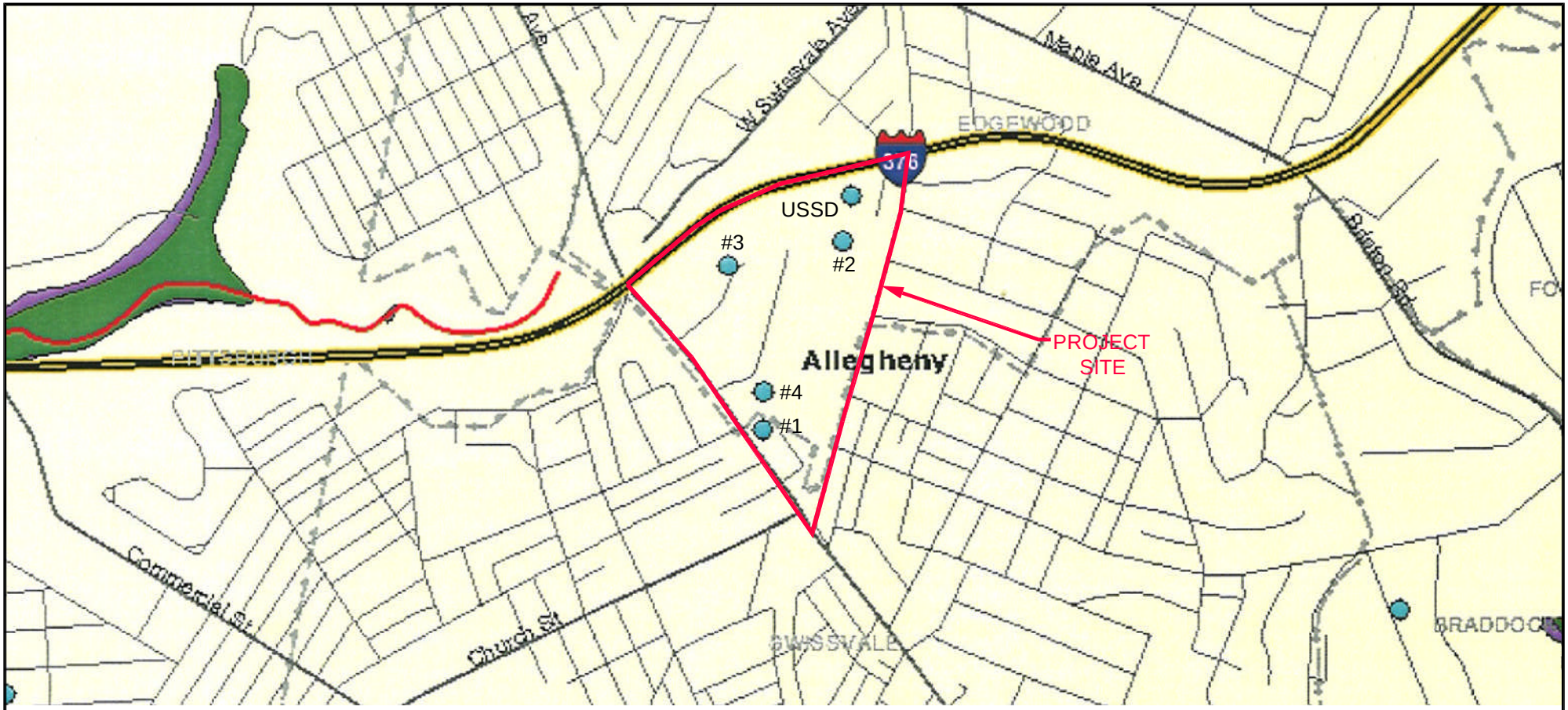

LEGEND

- STREAMS
- STATE HIGHWAY
- TOWNSHIP BOUNDARY
- FEMA 100 Yr FLOODPLAINS
- FLOODPLAINS - STATEWIDE
- OIL AND GAS WELL

REFERENCE:
Pennsylvania Department of Environmental Protection: Geospatial Data Center. "eMapPA." 2004. Pensylvania Department of Environmental Protection. 13 June 2008

0 1000 2000

SCALE IN FEET

N

TITLE	OIL & GAS WELLS AND STREAM QUALITY MAP		
PROJECT	Union Switch & Signal Division		
URS	4507 NORTH FRONT STREET, SUITE 200 HARRISBURG, PENNSYLVANIA 17110 (717) 635-7901 FAX (717) 635-7902 www.urscorp.com		
SCALE 1" = 1000'	DWN. BY AWJ	JOB NO. 20497896	
DATE 8/18/08	APPR. BY	FIG. NO. 3	

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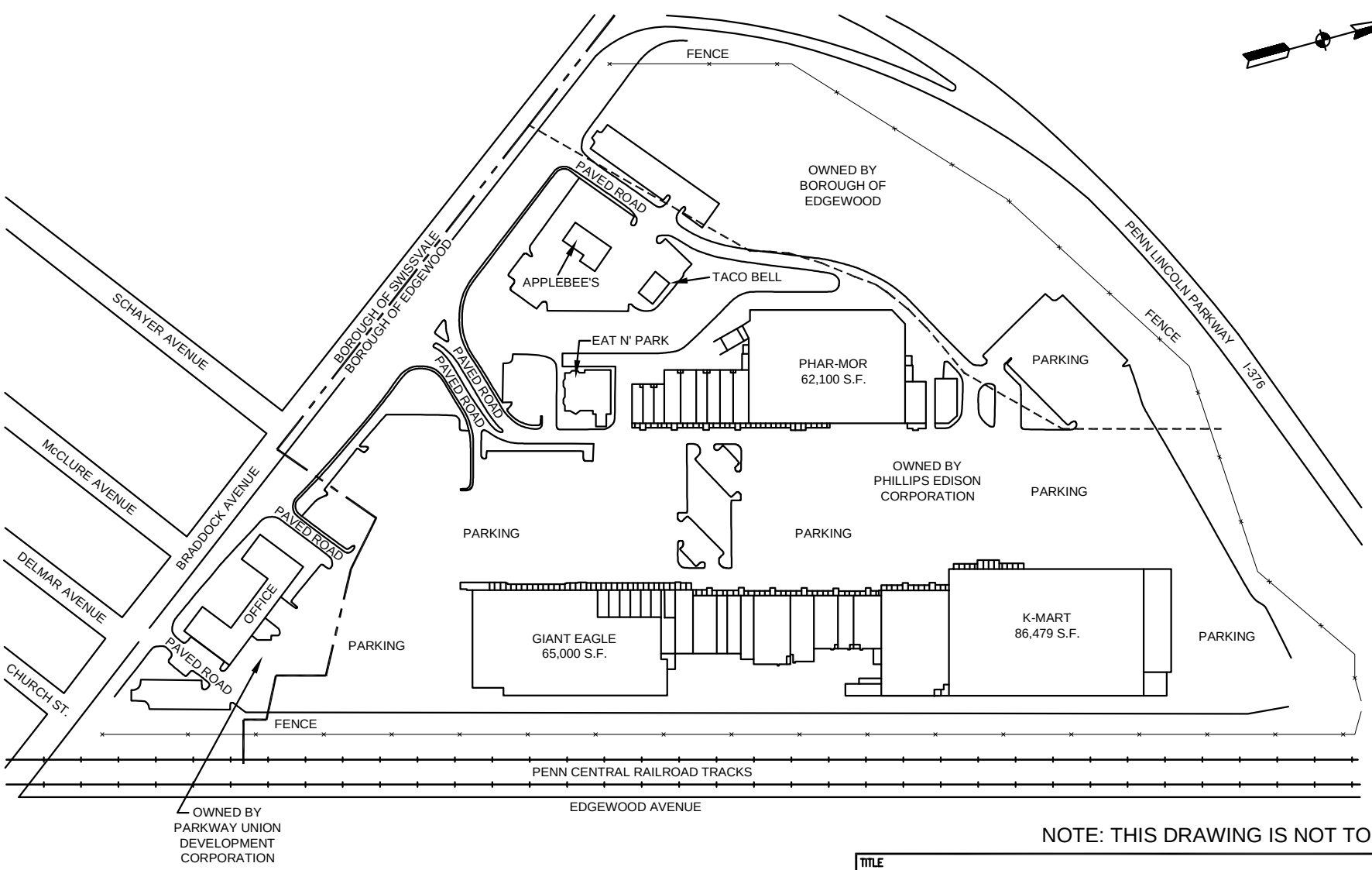

NOTE: THIS DRAWING IS NOT TO SCALE

LEGEND

BOROUGH BOUNDARY

PROPERTY LINE

REFERENCE:
ENVIRONMENTAL PRIORITIES INITIATIVE PRELIMINARY ASSESSMENT,
NUS CORPORATION, OCTOBER 24, 1989.

TITLE	CURRENT SITE MAP				
PROJECT	Union Switch & Signal Division				
	URS	4507 NORTH FRONT STREET, SUITE 200 HARRISBURG, PENNSYLVANIA 17110 (717) 635-7901 FAX (717) 635-7902 www.urscorp.com			
SCALE	N.T.S.	DWN. BY	JAK	JOB NO.	20497896
DATE	8/21/08	APPR. BY		FIG. NO.	4

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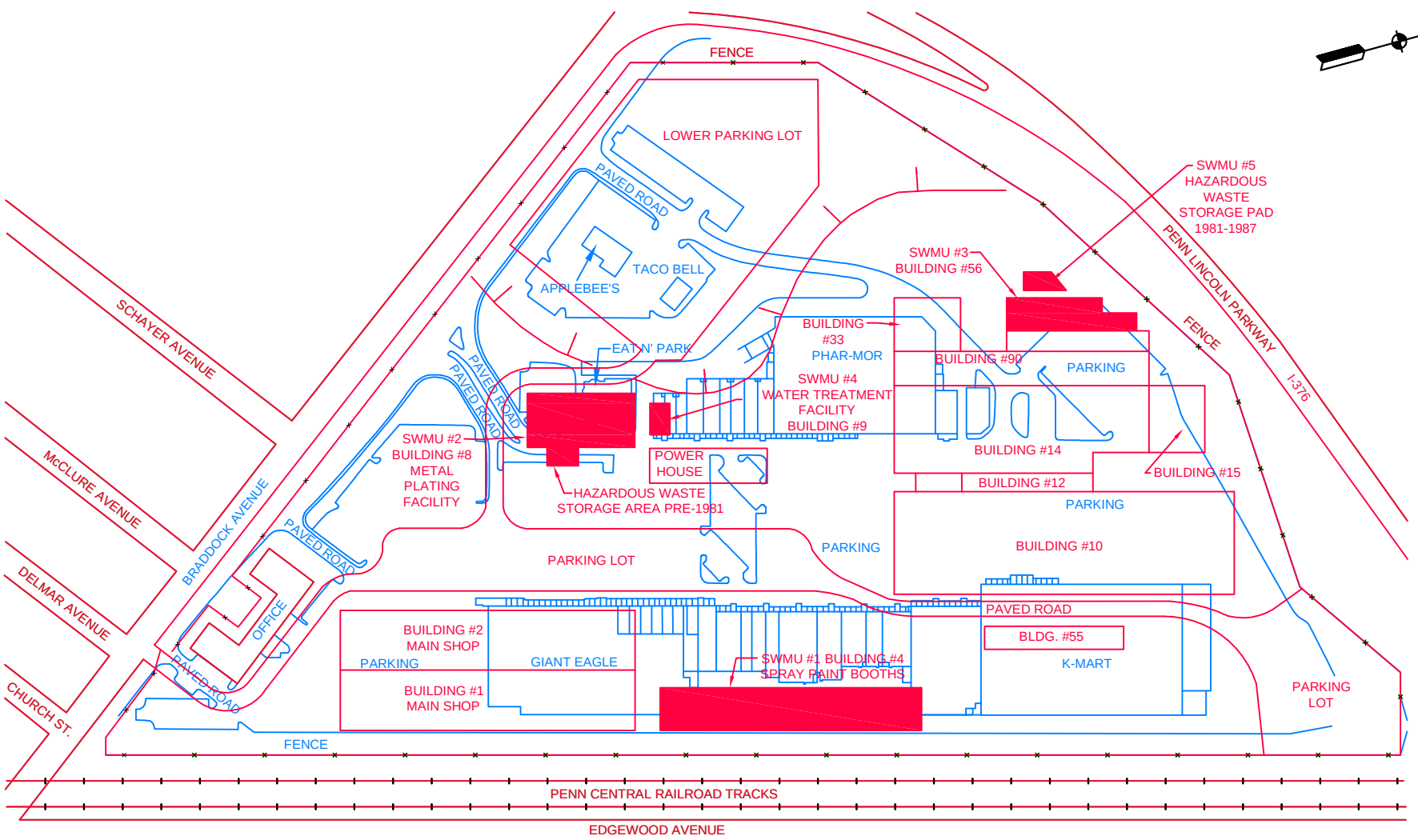

NOTE: THIS DRAWING IS NOT TO SCALE

LEGEND

- BOROUGH BOUNDARY
- PROPERTY LINE

OVERLAY LEGEND

- HISTORIC SITE
- CURRENT SITE

REFERENCE:
ENVIRONMENTAL PRIORITIES INITIATIVE PRELIMINARY ASSESSMENT,
NUS CORPORATION, OCTOBER 24, 1989.

TITLE

OVERLAY OF CURRENT AND HISTORIC MAP

PROJECT

Union Switch & Signal Division

URS

4507 NORTH FRONT STREET, SUITE 200
HARRISBURG, PENNSYLVANIA 17110
(717) 635-7901 FAX (717) 635-7902
www.urscorp.com

SCALE	N.T.S.	DWN. BY	JAK	JOB NO.	20497896
DATE	8/21/08	APPR. BY		FIG. NO.	5

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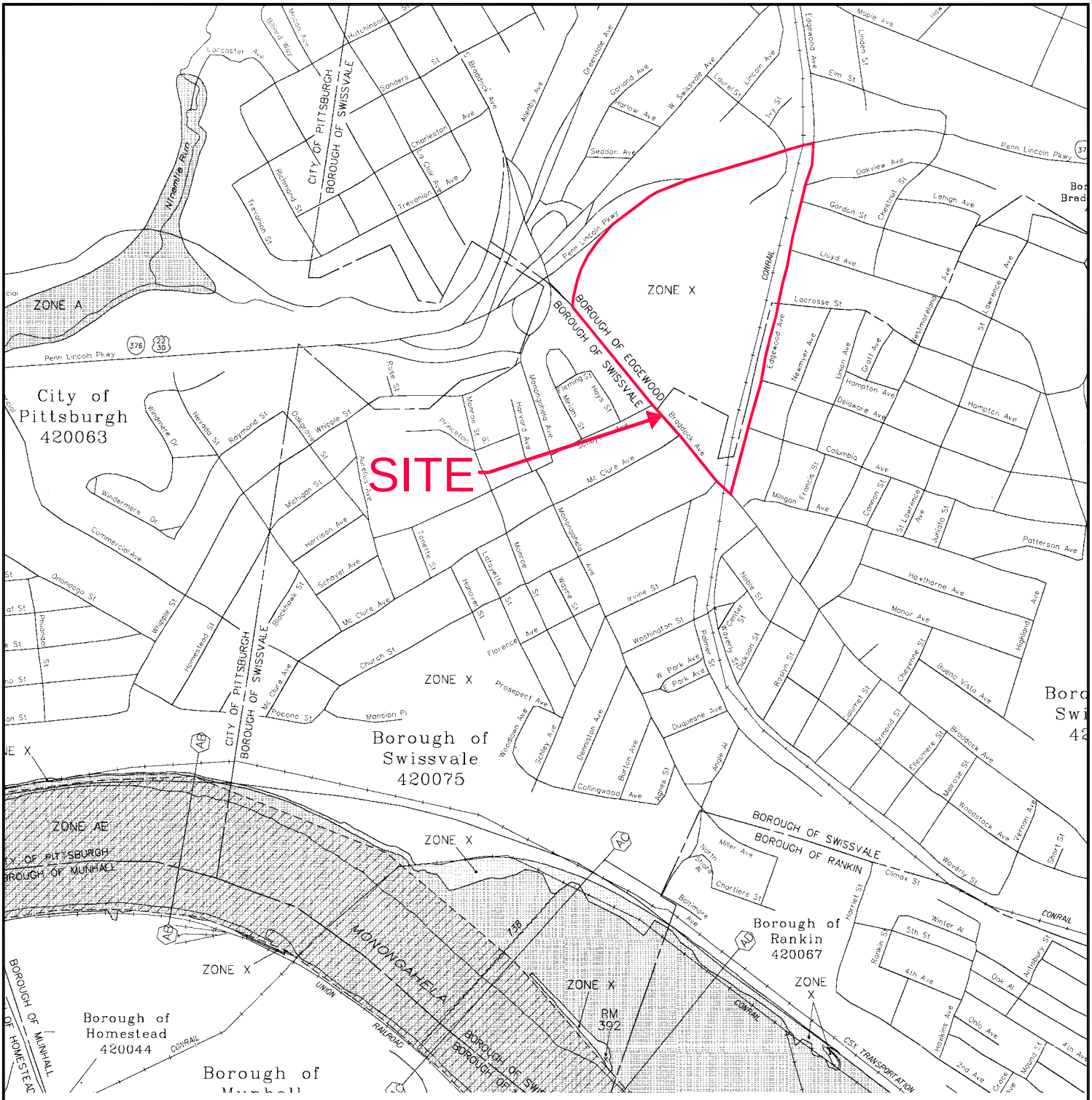

LEGEND

= AREAS OUTSIDE OF 500 YEAR FLOOD (ZONE X)

NOTE: A portion of FEMA Flood Insurance Rate Maps; Map Number 42003C0367 F, Panel 484,Allegheny County, Pennsylvania, October 4, 1995.

TITLE	FEMA FLOODPLAIN MAP
PROJECT	Union Switch & Signal Division

URS
4507 NORTH FRONT STREET, SUITE 200
HARRISBURG, PENNSYLVANIA 17110
(717) 635-7901 FAX (717) 635-7902
www.urscorp.com

SCALE	DWN. BY	JOB NO.
AS SHOWN	AWJ	20497896
DATE	APPR. BY	FIG. NO.
8/18/08		6

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APPENDIX A

INVENTORY OF DOCUMENTATION
AND
ELECTRONIC LIBRARY OF PADEP DOCUMENTS

APPENDIX A
INVENTORY OF DOCUMENTATION
AND
ELECTRONIC LIBRARY OF PADEP DOCUMENTS
Union Switch and Signal Division
1789 South Braddock Avenue, Swissvale, PA 15218

Not Dated: United States Department of the Interior Geological Survey – USEPA files

1. **July 15, 1977:** EPA Hazardous Waste Permit Application – USEPA files
2. **August 25, 1980:** Employee complaint with regards to dumping of oil waste – PADEP files
3. **September 18, 1980:** Waste Discharge Inspection Report as a result of complaint – PADEP files
4. **November 18, 1980:** General Information EPA Permit #PAD000001115 – USEPA files
5. **December 16, 1980:** Letter from USEPA to American Standard regarding Acknowledgement of Hazardous Waste Permit – USEPA files
6. **August 5, 1980:** PADEP Notification of Hazardous Waste Activity – USEPA files
7. **September 10, 1981:** Letter from USEPA to American Standard regarding approval of PART A – USEPA files
8. **November 23, 1981:** Part A Permit Application - PADEP files
9. **December 9, 1981:** Letter from PADEP to Borough of Swissvale regarding USSD permit – PADEP files
10. **June 6, 1982:** PADEP Notification of Hazardous Waste Facility – USEPA files
11. **June 7, 1982:** Amended Part A Permit – EPA files
12. **February 18, 1983:** Letter from PADER to American Standard regarding a formal request for PART B – USEPA files
13. **June 13, 1983:** Union Switch and Signal Topographic Map – USEPA files
14. **July 23, 1984:** Hazardous Waste Inspection Report – PADEP files
15. **August 11, 1983:** Letter from PADER to American Standard regarding granting an extension to submit PART B Hazardous Waste Permit – USEPA files
16. **August 29, 1983:** Letter from Union Switch to USEPA regarding signed Part B Operating Permit – USEPA files
17. **September 23, 1983:** Letter from USEPA to American Standard regarding a copy of PART B that was sent to the USEPA – USEPA files
18. **October 20, 1983:** Hazardous Waste Report – PADEP files
19. **April 13, 1984:** Letter from PADER to American Standard an incomplete for PART B – Hazardous Waste Permit - USEPA files, PADEP files
20. **May 14, 1984:** Letter from PADER to American Standard regarding granting an extension to submit Part B Hazardous Waste Permit – USEPA files, PADEP files
21. **June 22, 1984:** USS Letter regarding Part B Application – PADEP files
22. **June 27, 1984:** Inspection Report – PADEP files
23. **July 11, 1984:** Notice of Violation – PADEP file
24. **July 23, 1984:** Hazardous Waste Inspection Report – PADEP files
25. **September 17, 1984:** USS Lettering regarding Recent Inspection – PADEP files
26. **October 15, 1984:** USS Letter with Lab Analysis – PADEP files
27. **November 16, 1984:** PADER Letter Regarding Notice of Violation – PADEP files
28. **December 10, 1984:** USS Letter Regarding water soluble coolants – PADEP files
29. **January 16, 1985:** Hazardous Waste Inspection Report – PADEP files

30. **January 30, 1985:** Letter from PADER to Union Switch & Signal Company regarding a January 16, 1985 Site inspection (NOV) – PADEP and USEPA files
31. **February 22, 1985:** USS Response to Notice of Violation - PADEP files
32. **March 7, 1985:** PADEP Notification of Hazardous Waste Activity (Added: Ignitable)– USEPA files, PADEP files
33. **March 12, 1985:** USS Notice of Violation Response – PADEP files
34. **September 3, 1985:** PADER Memo regarding incorrect issuance of new identification number in error – PADEP files
35. **September 11, 1985:** Letter from American Standard to PADER regarding a modification to its Hazardous waste handling status – USEPA files
36. **October, 1985:** Introduction to USSD Closure Report – PADEP files
37. **October 15, 1985:** Letter form American Standard to PADER regarding the Sept. 11, 1985 letter – USEPA files
38. **November 27, 1985:** PADER Letter regarding Closure – PADEP files
39. **December 2, 1985:** PADER Letter regarding Part B Application – PADEP files
40. **December 2, 1985:** PADEP Letter regarding Part B Application Letter – PADEP files
41. **December 10, 1985:** Public Notice of Hazardous Waste facility Closure Plan- USEPA files
42. **March 31, 1986:** Quarterly Hazardous Waste Report – PADEP files
43. **July 8, 1986:** Hazardous Waste inspection Report- USEPA files, PADEP files
44. **July 16, 1986:** PADER Inspection Letter – PADEP files
45. **July 31, 1986:** Letter from USEPA to Union Switch & Signal Division regarding RCRA reauthorization – USEPA files
46. **September 17, 1986:** Letter from American Standard to USEPA regarding not wanting to be placed under RCRA – USEPA files
47. **January 27, 1987:** County Letter regarding Demolition – PADEP files
48. **February 12, 1987:** PADER Letter regarding Closure – PADEP files
49. **February 24, 1987:** Approval of Closure Plan dated October 1985 – USEPA files
50. **June 4, 1987:** USS letter regarding Closure – PADEP files
51. **July 1, 1987:** PADER Letter Regarding Closure – PADEP files
52. **July 27, 1987:** Letter from USEPA to American Standard regarding the filling out of the EPA National Survey of Hazardous Waste – USEPA files
53. **August 16, 1987:** Letter from USEPA to American Standard regarding the filling out of the EPA National Survey of Hazardous Waste – USEPA files
54. **October 19, 1987:** USS Letter regarding Closure – PADEP files
55. **November 6, 1987:** Letter from USEPA to American Standard regarding the filling out of the EPA National Survey of Hazardous Waste – USEPA files
56. **November 13, 1987:** Certificate of Closure for the Waste Storage Pad – USEPA files, PADEP files
57. **November 16, 1987:** Certificate of Closure for Owner and Operator – USEPA files
58. **December 7, 1987:** General Inspection Report – PADEP files
59. **December 11, 1987:** PADER letter regarding RCRA Inspection – PADEP files
60. **December 31, 1987:** PADER Closure Letter – PADEP files
61. **December 31, 1987:** PADER Letter regarding Closure – PADEP files
62. **January 18, 1988:** USS Letter regarding Manifested Waste – PADEP files
63. **February 19, 1988:** Letter from USEPA to American Standard regarding the filling out of the EPA National Survey of Hazardous Waste – USEPA files
64. **July 05, 1988:** Letter form USEPA to American Standard regarding filling out of the EPA National Survey of Hazardous Waste – USEPA files
65. **September 12, 1988:** Letter from USEPA to American Standard regarding filling out of the EPA National Survey of Hazardous Waste – USEPA files

66. **November 28, 1988:** Letter from American Standard to USEPA submitting the EPA National Survey of Hazardous Waste – USEPA files
67. **March 10, 1989:** Letter fro USEPA to American Standard regarding if corrective action is need at the Site – USEPA files
68. **July 26, 1989:** PADER Letter regarding Possible Contamination – PADEP files
69. **August 30, 1989:** PADER Site Inspection – USEPA files
70. **September 1, 1989:** Internal PADEP memo regarding Aug. 30, 1989 Site Inspection – USEPA files
71. **October 24, 1989:** NUS Report – USEPA files
72. **March 3, 1992:** Phase I Environmental Assessment Report – ODC files
73. **July 2, 1993:** PADER Site Ranking Document – PADER files
74. **December 1995:** Phase I Environmental Assessment Update Report – ODC files
75. **January 23, 1996:** CERCLIS Status – PADEP files
76. **February 6, 1996:** CERCLA Status Letter – PADEP files
77. **March 18, 1996:** Second Addendum to Phase I Environmental Assessment Update Report – ODC files
78. **July 1, 1996:** Wastewater Discharge – PADEP files

APPENDIX B

SITE PHOTOGRAPHIC LOG

URS

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Pennsylvania Department of Environmental Protection	1789 Braddock Avenue, Pittsburgh, PA 15218	20497896

Photo No. 1	Date: 11/6/08

Direction Photo Taken:

North

Description:

Sign located at the entrance to the Facility.

Photo No. 2	Date: 11/6/08

Direction Photo Taken:

West

Description:

Towne Center Office Building located adjacent to the Edgewood Towne Center Shopping Plaza which is owned by Oxford Development Corporation

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Pennsylvania Department of Environmental Protection	1789 Braddock Avenue, Pittsburgh, PA 15218	20497896

Photo No. 3	Date: 11/6/08

Direction Photo Taken:

South

Description:

Shops located in the Edgewood Towne Center.

Photo No. 4	Date: 11/6/08

Direction Photo Taken:

East

Description:

Shops located in the Edgewood Towne Center.

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Pennsylvania Department of Environmental Protection	1789 Braddock Avenue, Pittsburgh, PA 15218	20497896

Photo No. 5	Date: 11/6/08

Direction Photo Taken:

North

Description:

Shops located in the Edgewood Towne Center.

Photo No. 6	Date: 11/6/08

Direction Photo Taken:

South

Description:

Shops located in the Edgewood Towne Center where Building #4 – Spray Paint Booths (SWMU #1) were located.

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Pennsylvania Department of Environmental Protection	1789 Braddock Avenue, Pittsburgh, PA 15218	20497896

Photo No. 7	Date: 11/6/08

Direction Photo Taken:

North

Description:

Current parking lot which was the location of the former Hazardous Waste Storage Pad (SWMU #5) and Building #56 (SWMU #3).

Photo No. 8	Date: 11/6/08

Direction Photo Taken:

North

Description:

Storm water drain in upper parking lot area.

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Pennsylvania Department of Environmental Protection	1789 Braddock Avenue, Pittsburgh, PA 15218	20497896

Photo No. 9	Date: 11/6/08

Direction Photo Taken:

North

Description:

Apparent nonnative surface material northwest of upper parking lot

Photo No. 10	Date: 11/6/08

Direction Photo Taken:

North

Description:

Surface soil northwest of upper parking lot

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Pennsylvania Department of Environmental Protection	1789 Braddock Avenue, Pittsburgh, PA 15218	20497896

Photo No. 11	Date: 11/6/08

Direction Photo Taken:

West

Description:

Road to lower parking lot and Applebee's.

Photo No. 12	Date: 11/6/08

Direction Photo Taken:

North

Description:

Gate at Northeast corner of property to railroad tracks.

URS

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Pennsylvania Department of Environmental Protection	1789 Braddock Avenue, Pittsburgh, PA 15218	20497896

Photo No. 13	Date: 11/6/08

Direction Photo Taken:

North

Description:

Loading dock and dumpsters behind K-mart.

Photo No. 14	Date: 11/6/08

Direction Photo Taken:

North

Description:

Fire hydrant behind shopping mall.

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Pennsylvania Department of Environmental Protection	1789 Braddock Avenue, Pittsburgh, PA 15218	20497896

Photo No. 15	Date: 11/6/08

Direction Photo Taken:

East

Description:

Trash compactor located behind mall.

Photo No. 16	Date: 11/6/08

Direction Photo Taken:

North

Description:

Broken asphalt adjacent to upper parking lot.

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Pennsylvania Department of Environmental Protection	1789 Braddock Avenue, Pittsburgh, PA 15218	20497896

Photo No. 17	Date: 11/6/08

Direction Photo Taken:

North

Description:

Broken concrete adjacent to lower parking lot.

APPENDIX C

USEPA Checklists for:

1. RCRA Land Revitalization Indicators Status of Use & Type of Use Form

2. Migration of Contaminated Groundwater Under Control

3. Current Human Exposures Under Control

4. Evaluating the Vapor Intrusion to Indoor Air Pathway

RCRA Land Revitalization Indicators
Status of Use &Type of Use

EPA	**United States** **ENVIRONMENTAL PROTECTION AGENCY** **Region III, Philadelphia, PA**
1. Date: January, 2009	
2. Facility Name Union Switch & Signal Division	**3. EPA ID** PAD000001115
4. Your Name Rebecca Y. Walsh, PG	**5. Organization** URS, 4507 North Front Street Harrisburg, PA 17110
6. Total Acres 40 acres	

Continued Use: **Total acres**_____	**Reused:** **Total acres**__33 acres__	**Planned Reuse:** **Total acres**_____	**Unused:** **Total acres**_7 acres_
Types of Use	**Types of Use**	**Types of Use**	
( ) Agricultural	( ) Agricultural	( ) Agricultural	
( ) Commercial	(X) Commercial	( ) Commercial	
( ) Ecological	( ) Ecological	( ) Ecological	
( ) Industrial	( ) Industrial	( ) Industrial	
( ) Military	( ) Military	( ) Military	
( ) Other Federal	( ) Other Federal	( ) Other Federal	
( ) Public Services	( ) Public Services	( ) Public Services	
( ) Recreational	( ) Recreational	( ) Recreational	
( ) Residential	( ) Residential	( ) Residential	
( ) Mixed Use	( ) Mixed Use	( ) Mixed Use	

Unit Conversions: 1 square foot = 0.000023 acre; 1 square meter = 0.0002471 acre

Current Land Use

Continued Use - A site or portion of a site which is currently being used in the same general manner as it was when the site became contaminated. For example, continued use would be an appropriate description for a property where industrial operations resulted in the contamination and the property is still used as an operating industrial facility. The RCRA Program will count all acres of an active RCRA industrial facility as Continued Use, except for parcels specifically designated as Reused or Planned Reuse.

Reused - A site or portion of a site where a new use, or uses, is occurring such that there has been a change in the type of use (e.g. industrial to commercial) or the property was vacant and now supports a specific use. This means that the developed site, or portion of the site, is "open" or actually being used by customers, visitors, employees, residents, etc.

Planned Reuse - A site or portion of a site where a plan for new use is in place. This could include conceptual plans, a contract with a developer, secured financing, approval by the local government, or the initiation of site redevelopment.

Unused - A site or portion of a site that is currently vacant or not being used in any identifiable manner. This could be because site investigation and cleanup are on-going, operations ceased or owner is in bankruptcy, or cleanup is complete but the site remains vacant.

Types of Use

Commercial Use – Commercial use refers to use for retail shops, grocery stories, offices, restaurants and other businesses.

Public Service Use – Public service use refers use by a local or state government agency or a non-profit group to serve citizens' needs. This can include transportation services such as rail lines and bus depots, libraries and schools, government offices, public infrastructure such as roads, bridges, utilities or other services for the general public.

Agricultural Use – Agricultural uses refers to use for agricultural purposes, such as farmland for growing crops and pasture for livestock. It also can encompass other activities, such as orchards, agricultural research and development, and irrigating existing farmland.

Recreational Use – Recreational use refers to use for recreational activities, such as sports facilities, golf courses, ball fields, open space for hiking and picnicking, and other opportunities for indoor or outdoor leisure activities.

Ecological Use – Ecological use refers to areas where proactive measures, including a conservation easement, have been implemented to create, restore, protect or enhance a habitat for terrestrial and/or aquatic plants and animals, such as wildlife sanctuaries, nature preserves, meadows, and wetlands.

Industrial Use – Industrial use refers to traditional light and heavy industrial uses, such as processing and manufacturing products from raw materials, as well as fabrication, assembly, treatment, and packaging of finished products. Examples of industrial uses include factories, power plants, warehouses, waste disposal sites, landfill operations, and salvage yards.

Military Use – Military use refers to use for training, operations, research and development, weapons testing, range activities, logistical support, and/or provision of services to support military or national security purposes.

Other Federal Use – Other federal use refers to use to support the Federal government in federal agency operations, training, research, and/or provision of services for purposes other than national security or military.

Mixed Use – Mixed use refers to areas at which uses cannot be differentiated on the basis of acres. For example, a condominium with retail shops on the ground floor and residential use on the upper floors would fall into this category.

Residential Use – Residential use refers to use for residential purposes, including single-family homes, town homes, apartment complexes and condominiums, and child/elder care facilities.

DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION
RCRA Corrective Action
Environmental Indicator (EI) RCRIS code (CA750)

Migration of Contaminated Groundwater Under Control

Facility Name:	Former Union Switch & Signal Division
Facility Address:	1789 South Braddock Avenue, Pittsburgh, Pennsylvania 15218
Facility EPA ID #:	PAD 000001115

1. Has **all** available relevant/significant information on known and reasonably suspected releases to the groundwater media, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been **considered** in this EI determination?

X If yes - check here and continue with #2 below.

_____ If no – re-evaluate existing data, or

_____ If data are not available skip to #8 and enter "IN" (more information needed) status code

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

Definition of "Current Human Exposures under Controls" EI

A positive "Current Human Exposures under Control" EI determination ("YE" status code) indicates that there are no "unacceptable" human exposures to "contamination" (i.e., contaminants in concentrations in excess of appropriate risk-based levels) that can be reasonably expected under current land- and groundwater-use conditions (for all "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

Relationship of EI to Final Remedies

While Final remedies remain the long-term objective of the RCRA Corrective Action program, the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993 (GPRA). The "Migration of Contaminated Groundwater under Control" EI pertains ONLY to the physical migration (i.e., further spread) of contaminated groundwater and contaminants within groundwater (e.g., non aqueous phase liquids or NAPLs). Achieving this EI does not substitute for achieving other stabilization or final remedy requirements and expectations associated with sources of contamination and the need to restore, wherever practicable, contaminated groundwater to be suitable for its designated current and future uses.

Duration / Applicability of EI Determinations

EI Determinations status codes should remain in RCRIS national database ONLY as long as they remain true (i.e., RCRIS status codes must be changed when the regulatory authorities become aware of contrary information).

Migration of Contaminated Groundwater Under Control
Environmental Indicator (EI) RCRIS code (CA750)

2. Is **groundwater** known or reasonably suspected to be "contaminated"[1] above appropriately protective risk-based "levels" (applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action anywhere at, or from, the facility?

_____	If yes – continue after identifying key contaminants, citing appropriate "levels," and referencing supporting documentation.
_____	If no – skip to #8 and enter "YE" status code, after citing appropriate "levels," and referencing supporting documentation to demonstrate that groundwater is not "contaminated."
X	If unknown (for any media) – skip to #8 and enter "IN" status code.

Rationale and Reference(s):

Figures, tables, and superscript references cited herein apply to those items presented in the EI report to which this checklist is an appendix. Additionally, acronyms applied in the following checklist responses are defined in the "Glossary of Acronyms" in the EI Report to which this checklist is an appendix

The USSD facility operations were previously assessed by NUS Corporation as part of USEPA Contract No. 68-01-7346. A Site visit was conducted by NUS personnel on May 18, 1989, and, in accordance with Technical Directive Document No. F3-8903-69, the resulting Environmental Priorities Initiative PAR(71) was issued on October 24, 1989. URS was contracted by PADEP to gather relevant information to complete this current EI assessment. To complete this SOW, URS has conducted an extensive records search at the PADEP SWRO. In addition, records acquired from the USEPA Region III Philadelphia Office via PADEP were reviewed and a site visit was conducted on November 6, 2008, at the former USSD location.

Former Spray Paint Booths: Four spray paint booths were used at the Site from approximately 1970 until July 1987 to paint products prior to shipment. Waste paint from the spray booths was washed into a 600-gallon tank that was used to precipitate paint. Paint sludge from the precipitate tank was removed and place in 55-gallon drums for disposal. Approximately 30 drums of waste paint sludge, eight drums of paint residue (containing lead and xylene) and four drums of air filters (holding leaded paint) per year were generated from the spray paint booths. The spray paint booths were demolished in 1989 following Parkway Union Development Corporation's (PUDC) purchase of the property in January 1988. The impact that activities in this building may have had (past or present) on the Site environmental media, including groundwater, is unknown.

Former Metal-Plating Facility: The metal plating facility operated from the mid-1960s until July 1987and was where the plating of steel, aluminum, brass, copper, and bronze using various electrical and mechanical components of railroad signaling and control systems occurred following cleaning of the parts using an alkaline base wash, sulfuric and muriatic acids. Trichloroethene (TCE) was used as a degreasing agent. High levels of chromium, cadmium, copper, zinc, and aluminum metals were used in the plating baths. Plating bath sludges and spent TCE were drummed and held at the hazardous waste storage pad until disposal. Approximately 24 drums of treatment sludge, 25 drums spent bath material and six drums of plating bath sludge were generated each year. Prior to November 1980 a Hazardous Waste Storage Area was located east of the metal-plating facility before it was moved west of Building #56. The metal-plating facility was demolished after PUDC purchased the property in January 1988. The impact that the activities in this building may have had (past or present) on the Site environmental media, including groundwater, is unknown.

[1] "Contamination" and "contaminated" describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriate "levels" (appropriate for the protection of the groundwater resource and its beneficial uses).

Former Hazardous Waste Storage Pad: The hazardous waste storage pad was a 1,950-square foot concrete pad located west of Building #56 used to store all drummed hazardous waste generated by USSD. Stored waste included paint booth waste, metal-plating wastes, metal heat treatment wastes, spent TCE and small amounts of battery acid from vehicles used on site. The pad was constructed in 1981 and closed with PADER approval in December 1987 before PUDC purchased the property. However, URS was unable to identify and review any analytical data associated with the closure of the pad. The impact of waste storage from this pad on groundwater is unknown.

Former UST Areas: During the decommissioning of the USSD site in 1987 and the construction of the Edgewood Towne Centre in 1988, 37 USTs were removed[72]. Removal of these tanks occurred prior to the PADER UST program which became effective in August 1989; therefore, no UST closure documents were filed. The location and content of these tanks are unknown. The impact that possible tanks releases may have had (past or present) on the Site environmental media, including groundwater, is unknown.

Summary: Groundwater is reportedly not used on site. On-site groundwater use is not deed restricted. There are no known domestic or industrial wells located with a mile of the Site. Groundwater flow is presumably south-southwest toward the Monogahela River. There are no known controls of off-site groundwater flow and no knowledge as to whether such controls are necessary based on information currently available.

Migration of Contaminated Groundwater Under Control
Environmental Indicator (EI) RCRIS code (CA750)

3. Has the **migration** of contaminated groundwater **stabilized** (such that contaminated groundwater is expected to remain within "existing area of contaminated groundwater"[1] as defined by the monitoring locations designated at the time of this determination)?

_____ If yes - continue, after presenting or referencing the physical evidence (e.g., groundwater sampling/measurement/migration barrier data) and rationale why contaminated groundwater is expected to remain within the (horizontal or vertical) dimensions of the "existing area of groundwater contamination"[2])

_____ If no (contaminated groundwater is observed or expected to migrate beyond the designated locations defining the "existing area of groundwater contamination"[2]) - skip to #8 and enter "NO" status code, after providing an explanation.

_____ If unknown - skip to #8 and enter "IN" status code.

Rationale and Reference(s):

No rationale warranted.

[1] "Existing area of contaminated groundwater" is an area (with horizontal and vertical dimensions) that has been verifiably demonstrated to contain all relevant groundwater contamination for this determination, and is defined by designated (monitoring) locations proximate to the outer perimeter of "contamination" that can and will be sampled/tested in the future to physically verify that all “contaminated” groundwater remains within this area, and that the further migration of "contaminated" groundwater is not occurring. Reasonable allowances in the proximity of the monitoring locations are permissible to incorporate formal remedy decisions (i.e., including public participation) allowing a limited area for natural attenuation.

Migration of Contaminated Groundwater Under Control
Environmental Indicator (EI) RCRIS code (CA750)

4. Does "contaminated" groundwater **discharge** into **surface water** bodies?

_____ If yes - continue after identifying potentially affected surface water bodies.

_____ If no - skip to #7 (and enter a "YE" status code in #8, if #7 = yes) after providing an explanation and/or referencing documentation supporting that groundwater "contamination" does not enter surface water bodies.

_____ If unknown - skip to #8 and enter "IN" status code.

Rationale and Reference(s):

No rationale warranted.

Migration of Contaminated Groundwater Under Control
Environmental Indicator (EI) RCRIS Code (CA750)

5. Is the **discharge** of "contaminated" groundwater into surface water likely to be **"insignificant"** (i.e., the maximum concentration [2] of each contaminant discharging into surface water is less than 10 times their appropriate groundwater "level," and there are no other conditions (e.g., the nature, and number, of discharging contaminants, or environmental setting), which significantly increase the potential for unacceptable impacts to surface water, sediments, or eco-systems at these concentrations)?

_____ If yes - skip to #7 (and enter "YE" status code in #8 if #7 = yes), after documenting: 1) the maximum known or reasonably suspected concentration[3] of key contaminants discharged above their groundwater "level," the value of the appropriate "level(s)," and if there is evidence that the concentrations are increasing; and 2) provide a statement of professional judgment/explanation (or reference documentation) supporting that the discharge of groundwater contaminants into the surface water is not anticipated to have unacceptable impacts to the receiving surface water, sediments, or eco-system.

_____ If no - (the discharge of "contaminated" groundwater into surface water is potentially significant) - continue after documenting: 1) the maximum known or reasonably suspected concentration of each contaminant discharged above its groundwater "level," the value of the appropriate "level(s)," and if there is evidence that the concentrations are increasing; and 2) for any contaminants discharging into surface water in concentrations[3] greater than 100 times their appropriate "level(s)," and if estimated total amount (mass in kg/yr) of each of these contaminants that are being discharged (loaded) into the surface water body (at the time of the determination), and identify if there is evidence that the amount of discharging contaminants is increasing. .

_____ If unknown - enter "IN" status code in #8.

Rationale and Reference(s):

No rationale warranted.

[2] As measured in groundwater prior to entry to the groundwater-surface water/sediment interaction (e.g., hyporheic) zone.

Migration of Contaminated Groundwater Under Control
Environmental Indicator (EI) RCRIS code (CA750)

6. Can the **discharge** of "contaminated" groundwater into surface water be shown to be **"currently acceptable"** (i.e., not cause impacts to surface water, sediments or eco-systems that should not be allowed to continue until a final remedy decision can be made and implemented[3])?

_____ If yes - continue after either: 1) identifying the Final Remedy decision incorporating these conditions, or other site-specific criteria (developed for the protection of the site's surface water, sediments, and eco-systems), and referencing supporting documentation demonstrating that these criteria are not exceeded by the discharging groundwater; OR 2) providing or referencing an interim-assessment[4] appropriate to the potential for impact, that shows the discharge of groundwater contaminants into the surface water is (in the opinion of a trained specialists, including ecologist) adequately protective of receiving surface water, sediments, and eco-systems, until such time when a full assessment and final remedy decision can be made. Factors which should be considered in the interim-assessment (where appropriate to help identify the impact associated with discharging groundwater) include: surface water body size, flow, use/classification/habitats and contaminant loading limits, other sources of surface water/sediment contamination, surface water and sediment sample results and comparisons to available and appropriate surface water and sediment "levels," as well as any other factors, such as effects on ecological receptors (e.g., via bio-assays/benthic surveys or site-specific ecological Risk Assessments), that the overseeing regulatory agency would deem appropriate for making the EI determination.

_____ If no - (the discharge of "contaminated" groundwater can not be shown to be **"currently acceptable")** – skip to #8 and enter a "NO" status, after documenting the currently unacceptable impacts to the surface water body, sediments, and/or eco-systems.

_____ If unknown – skip to 8 and enter "IN" status code.

Rationale and Reference(s):

No rationale warranted.

[3] Note, because areas of inflowing groundwater can be critical habitats (e.g., nurseries or thermal refugia) for many species, appropriate specialist (e.g., ecologist) should be included in management decisions that could eliminate these areas by significantly altering or reversing groundwater flow pathways near surface water bodies.

[4] The understanding of the impacts of contaminated groundwater discharges into surface water bodies is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration to be reasonably certain that discharges are not causing currently unacceptable impacts to the surface waters, sediments or eco-systems.

Migration of Contaminated Groundwater Under Control
Environmental Indicator (EI) RCRIS code (CA750)

7. Will groundwater **monitoring** / measurement data (and surface water/sediment/ecological data, as necessary) be collected in the future to verify that contaminated groundwater has remained within the horizontal (or vertical, as necessary) dimensions of the "existing area of contaminated groundwater?"

_____ If yes - continue after providing or citing documentation for planned activities or future sampling/measurement events. Specifically identify the well/measurement locations which will be tested in the future to verify the expectation (identified in #3) that groundwater contamination will not be migrating horizontally (or vertically, as necessary) beyond the "existing area of groundwater contamination."

_____ If no - enter "NO" status code in #8.

_____ If unknown - enter "IN" status code in #8.

Rationale and Reference(s):

No rationale warranted.

Migration of Contaminated Groundwater Under Control
Environmental Indicator (EI) RCRIS code (CA750)

8. Check the appropriate RCRIS status codes for the Migration of Contaminated Groundwater Under Control EI (event code CA750), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (attach appropriate supporting documentation as well as a map of the facility).

_____	YE – Yes, "Migration of contaminated Groundwater Under Control" has been verified.
_____	NO – Unacceptable migration of contaminated groundwater is observed or expected.
X	IN – More information is needed to make a determination.

Completed by: (signature) _____ Date _____

(print) _____

(title) _____

Supervisor: (signature) _____ Date _____

(print) _____

(title) _____

(EPA Region or State) _____

Locations where References may be found:

USEPA documents referenced herein can be found at USEPA's Region III office in Philadelphia, PA. PADEP files obtained from the Southwest Regional office (SWRO) in Pittsburgh, PA are provided in pdf format on CD in Appendix A of the EI Report to which this checklist is also an Appendix (C). Additional documents may be located at the PADEP SWRO.

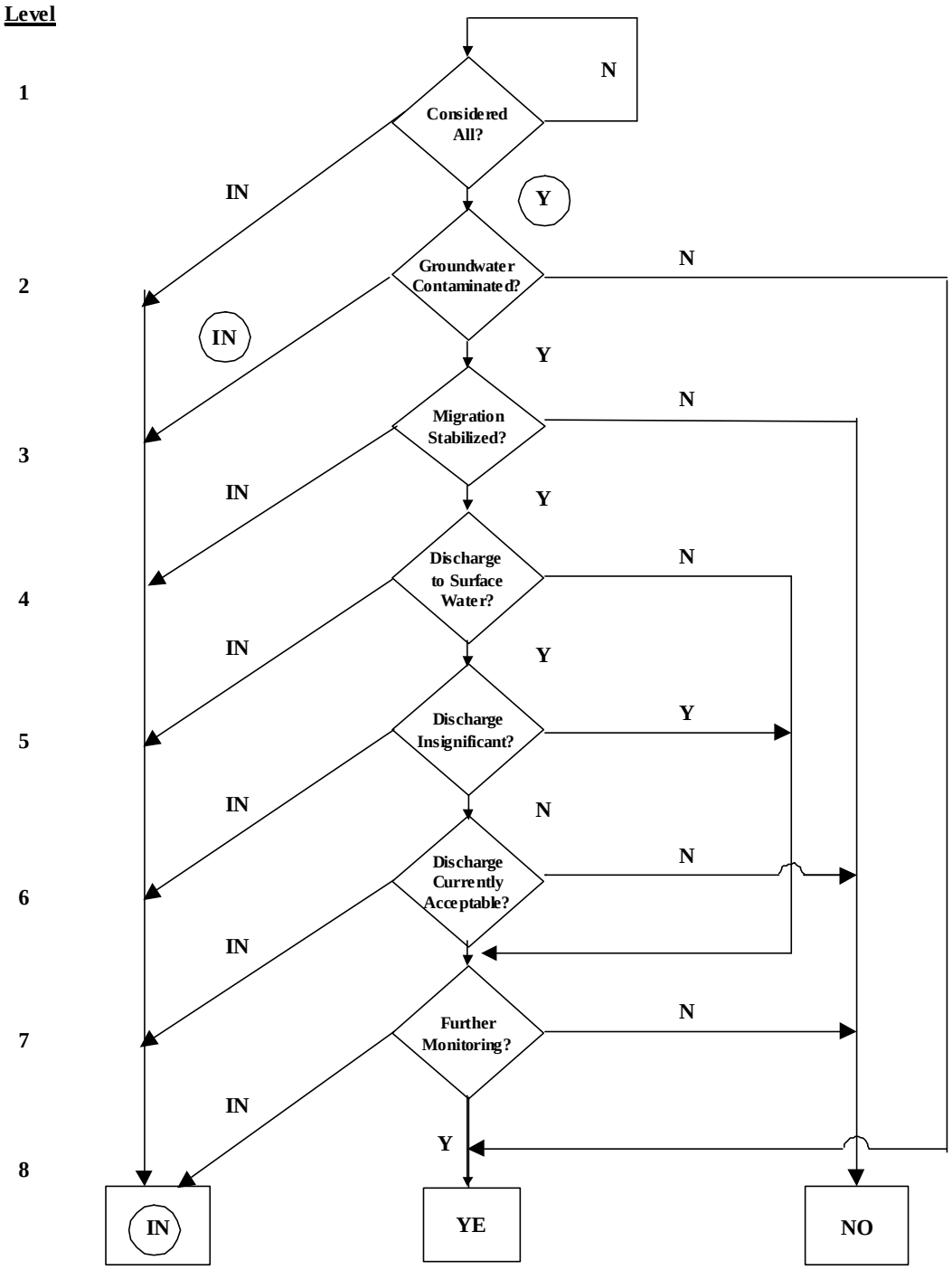
Contact telephone and e-mail numbers:

_____

_____

_____

MIGRATION OF CONTAMINATED GROUNDWATER UNDER CONTROL (CA 750)



DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION
RCRA Corrective Action
Environmental Indicator (EI) RCRIS code (CA725)

Current Human Exposures Under Control

Facility Name:	Former Union Switch & Signal Division
Facility Address:	1789 South Braddock Avenue, Pittsburgh, Pennsylvania 15218
Facility EPA ID #:	PAD 000001115

1. Has **all** available relevant/significant information on known and reasonably suspected releases to soil, groundwater, surface water/sediments, and air, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been **considered** in this EI determination?

X If yes – check here and continue with #2 below.

_____ If no – re-evaluate existing data, or

_____ If data are not available skip to #6 and enter "IN" (more information needed) status code

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

Definition of "Current Human Exposures Under Controls" EI

A positive "Current Human Exposures Under Control" EI determination ("YE" status code) indicates that there are no "unacceptable" human exposures to "contamination" (i.e., contaminants in concentrations in excess of appropriate risk-based levels) that can be reasonably expected under current land- and groundwater-use conditions (for all "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

Relationship of EI to Final Remedies

While Final remedies remain the long-term objective of the RCRA Corrective Action program, the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993 (GPRA). The "Current Human Exposures Under Control" EI are for reasonably expected human exposures under current land- and groundwater-use conditions ONLY, and do not consider potential future land- or groundwater-use conditions or ecological receptors. The RCRA Corrective Action program's overall mission to protect human health and the environment requires that Final remedies address these issues (i.e., potential future human exposure scenarios, future land and groundwater uses, and ecological receptors).

Duration / Applicability of EI Determinations

EI Determinations status codes should remain in RCRIS national database ONLY as long as they remain true (i.e., RCRIS status codes must be changed when the regulatory authorities become aware of contrary information).

Current Human Exposures Under Control
Environmental Indicator (EI) RCRIS code (CA725)

2. Are groundwater, soil, surface water, sediments, or air media known or reasonably suspected to be "contaminated"[1] above appropriately protective risk-based "levels" (applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action (from SWMUs, RUs or AOCs)?

	Yes	No	?	Rationale/Key Contaminants
Groundwater			X	See rationale below.
Air (indoors)[2]			X	See rationale below.
Surface Soil (e.g., <2 ft)			X	See rationale below.
Surface Water			X	See rationale below.
Sediment			X	See rationale below.
Subsurface Soil (e.g., >2 ft)			X	See rationale below.
Air (outdoors)		X		See rationale below.

_____ If no (for all media) – skip to #6, and enter "YE," status code after providing or citing appropriate "levels," and referencing sufficient support documentation demonstrating that these "levels" are not exceeded.

_____ If yes (for any media) – continue after identifying key contaminants in each "contaminated" medium, citing appropriate "levels" (or provide an explanation for the determination that the medium could pose an unacceptable risk), and referencing supporting documentation.

X If unknown (for any media) – skip to #6 and enter "IN" status code.

Rationale and Reference(s):

Figures, tables, and superscript references cited herein apply to those items presented in the EI report to which this checklist is an appendix. Additionally, acronyms applied in the following checklist responses are defined in the "Glossary of Acronyms" in the EI Report to which this checklist is an appendix

The USSD facility operations were previously assessed by NUS Corporation as part of USEPA Contract No. 68-01-7346. A Site visit was conducted by NUS personnel on May 18, 1989, and, in accordance with Technical Directive Document No. F3-8903-69, the resulting Environmental Priorities Initiative PAR(71) was issued on October 24, 1989. URS was contracted by PADEP to gather relevant information to complete this current EI assessment. To complete this SOW, URS has conducted an extensive records search at the PADEP SWRO. In addition, records acquired from the USEPA Region III Philadelphia Office via PADEP were reviewed and a site visit was conducted on November 6, 2008, at the former USSD location.

1. Groundwater:

Forme Spray Paint Booths: Four spray paint booths were used at the Site from approximately 1970 until July 1987 to paint products prior to shipment. Waste paint from the spray booths was washed into a 600-gallon tank that was used to precipitate paint. Paint sludge from the precipitate tank was removed and place in 55-gallon drums for disposal. Approximately 30 drums of waste paint sludge, eight drums of paint residue (containing lead and xylene) and four drums

[1] "Contamination" and "contaminated" describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriately protective risk-based "levels" (for the media, that identify risks within the acceptable risk range).

[2] Recent evidence (from the Colorado Dept. of Public Health and Environment, and others) suggest that unacceptable indoor air concentrations are more common in structures above groundwater with volatile contaminants than previously believed. This is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration necessary to be reasonably certain that indoor air (in structures located above (and adjacent to) groundwater with volatile contaminants) does not present unacceptable risks.

of air filters (holding leaded paint) per year were generated from the spray paint booths. The spray paint booths were demolished in 1989 following Parkway Union Development Corporation's (PUDC) purchase of the property in January 1988. The impact the activities in this building may have had (past or present) on Site environmental media, including groundwater, is unknown.

Former Metal-Plating Facility: The metal plating facility operated from the mid-1960s until July 1987and was where the plating of steel, aluminum, brass, copper, and bronze using various electrical and mechanical components of railroad signaling and control systems occurred following cleaning of the parts using an alkaline base wash, sulfuric and muriatic acids. Trichloroethlene (TCE) was used as a degreasing agent. High levels of chromium, cadmium, copper, zinc, and aluminum metals were used in the plating baths. Plating bath sludges and spent TCE were drummed and held at the hazardous waste storage pad until disposal. Approximately 24 drums of treatment sludge, 25 drums of spent bath material and six drums of plating bath sludge were generated each year. Prior to November 1980, a Hazardous Waste Storage Area was located east of the metal-plating facility before it was moved west of Building #56. The metal-plating facility was demolished after PUDC purchased the property in January 1988. The impact that the activities in this building may have had (past or present) on theSite environmental media, including groundwater, is unknown.

Former Hazardous Waste Storage Pad: The hazardous waste storage pad was a 1,950-square foot concrete pad located west of Building #56 used to store all drummed hazardous waste generated by USSD. Stored waste included paint booth waste, metal-plating wastes, metal heat treatment wastes, spent TCE and small amounts of battery acid from vehicles used on site. The pad was constructed in 1981 and closed with PADER approval in December 1987 before PUDC purchased the property. However, URS was unable to identify and review any analytical data associated with the closure of the pad. The impact caused by waste storage at this feature on the Site groundwater is unknown.

Former UST Areas: During the decommissioning of the USSD site in 1987 and the construction of the Edgewood Towne Centre in 1988, 37 USTs were removed[(72)]. Removal of these tanks occurred prior to the PADER UST program which became effective in August 1989; therefore, no UST closure documents were filed. The location and content of these tanks are unknown. The impact that possible tank releases may have had (past or present) on Site environmental media, including groundwater, is unknown.

Summary: Groundwater is reportedly not used on site. On-site groundwater use is not deed restricted. There are no known domestic or industrial wells located with a mile of the Site. Groundwater flow is presumably south-southwest toward the Monogahela River. There are no known controls of off-site groundwater flow, and no knowledge exists as to whether such controls are necessary based on information currently available.

2. Indoor Air:

Former Spray Paint Booths: There have been no investigations to date of Site groundwater which would be necessary to evaluate possible former spray paint booth impact. Groundwater present within 100 feet (the radius specified by USEPA and PADEP for consideration of the vapor instruction pathway) of current buildings may have been impacted by the former paint booths, thus necessitating subsequent evaluation of the potential impacts to indoor air via vapor intrusion. Also, future construction of new buildings in the former lagoon area, though not currently planned, could place a structure within 100 feet of potentially-contaminated former paint booth soils, another possible vapor source.

Former Metal-Plating Facility: The former metal plating facility operated from the mid-1960s until July 1987and was where TCE and many metals were used in the plating baths. The original hazardous waste storage area was located west of this facility until 1980. No soil or groundwater data was identified from the former metal-plating facility and hazardous waste storage area before, during, or after demolition in January 1988. Consequently, there is insufficient information to adequately evaluate probable impact to indoor air in present occupied structures within 100 feet of where the former metal-plating facility and former hazardous waste storage area once existed.

Former Hazardous Waste Storage Pad: The former hazardous waste storage pad was in existence from 1981 to 1987 and was used to store drummed paint booth waste, metal-plating wastes, metal heat treatment wastes, spent TCE and small amounts of battery acid. There is no groundwater or soil data associated with the closure of the pad. Consequently there is insufficient information to adequately evaluate probable impact to indoor air in present occupied structures within 100 feet of where the former metal-plating facility and former hazardous waste storage area once stood.

Former UST Areas: Thirty-seven USTs were removed from the site in 1987 and 1988[72]. Removal of these tanks occurred prior to the PADER UST program that became effective in August 1989; therefore, no UST documents were filed. The size, location, and content of these tanks is unknown. There is no soils data from the tank grave areas for individual organic constituents that may have been within 100 feet of existing occupied buildings. Because concentrations of individual organic constituents in these soils were not quantified, it is unknown whether they may be a vapor source to current or future structures at the Site.

Summary: There are currently no controls on the indoor air pathways at the Site. It is unknown whether such controls are needed to mitigate the soil vapor/groundwater-to-indoor air pathway because there is no data available for the Site to determine if the pathway is complete. Further investigation of Site soils and groundwater would be necessary to determine if the vapor intrusion to indoor air pathway is complete and, if so, to dictate possible implementation of controls such as deed restrictions on further construction or engineering controls for existing buildings.

3. Surface Soils (0-2 feet):

Surface soil samples were not collected as part of the Site investigation performed by NUS Corporation in 1989. This URS assessment was a non-sampling site reconnaissance. The URS site visit in November 2008 was also a non-sampling reconnaissance. The following two types of soil were observed by URS at the surface in the vacant area west of the upper parking lot: 1) black to dark grey fill material containing gravel and asphalt fragments and 2) light brown sand and silt, poorly sorted with some gravel. URS did not identify and review any sediment sampling information in either USEPA or PADEP files.

4. Sediment:

Sediment samples were not collected as part of the Site investigation performed by NUS Corporation in 1989 nor during this URS assessment. URS did not identify and review any sediment sampling information in either USEPA or PADEP files.

5. Surface Water:

The nearest surface water body is Ninemile Run, located approximately one quarter mile west of the facility. Ninemile Run flows into the Monogahela River at approximately one and a half miles southwest of the Site. The Monogahela River merges with the Allegheny River to form the Ohio River approximately five miles west of the Site.

PADEP identifies Ninemile Run as an approved Streams Integrated List Non Attain stream according to the standards set by the Pennsylvania Clean Water Act. These standards are based upon aquatic life, fish consumption, recreational use and potable water supply criteria (**Figure 3** of the EI Report). The FEMA Floodplain map indicates that the facility is outside the 500 year flood zone (**Figure 6** of the EI Report). URS did not observe any of the surface water bodies at the time of the November 2008 Site visit. A dry drainage ditch was noted west of the upper parking lot draining towards I-376.

The current site owners of the former USSD facility, PUDC (Towne Centre Office Building), Phillips Edison Corporation (Edgewood Towne Centre) and the Borough of Edgewood hold no NPDES permits, and thus, there is no known direct discharge to the surface water. Wastewater generated on Site is sent to the municipality for processing. An on-site storm water drainage collection system was observed by URS during the November 2008 site visit.

The potential for indirect off-site contaminants to surface water is possible via groundwater flow pathway. The possible sources of contamination to on Site groundwater were outlined above in Item 1 (Groundwater Rationale). As the groundwater from gradient for the Site has not been established and there is currently insufficient information relative to groundwater quality from possible Site sources, it is not possible at this time to determine if potentially impacted groundwater may be discharging to either surface water bodies located west or southwest of the Site. Therefore, it is currently unknown whether a complete exposure pathway from surface water to off-site human and ecological receptors is present, or, if it is, whether the diffuse groundwater discharges would results in unacceptable exposure to off-site human or ecological receptors. If Site groundwater data are collected and some impact is indicated towards a surface

water body, a groundwater discharge-to-surface water pathway evaluation may be necessary to assess potential surface water impacts..

6. Subsurface Soil (>2 feet):

As discussed in Item 2 (Indoor Air Rationale), 37 former USTs were removed from the Site during 1987 and 1988. The location, size and content of these USTs are unknown. It is known that in the former paint booth area paint waste (containing lead and xylene) was collected in a 600-gallon tank. In addition, in the former metal plating facility, TCE was used as a degreasing agent and that several different plating baths containing high level of chromium, cadmium, copper, zinc, and aluminum were used at the former metal plating facility.

URS did not identify and review any subsurface soil information in either USEPA or PADEP files. Because the concentrations of organic and inorganic constituents in these soils were not quantified, it is unknown whether they meet current PADEP Act 2 MSCs for soils.

Possible receptors to on Site subsurface soils (2 to 15 feet bgs) would include utility workers or future construction workers. The soils in the former UST areas could possibly be encountered by these receptor groups. Because the chemical quality of these soils is unknown, it cannot be determined whether a current or future complete exposure pathway is present.

7. Outdoor Air:

The USSD site is currently an inactive facility that was used for the production of electrical and mechanical components for railroad signaling and switching systems which operated from approximately 1880 until 1987. Exhaust fans in the process areas and the paint booths once existed when the site was operational. Air emission stacks were observed in photographs of the metal plating facility taken during the NUS May 1989 site visit. Site operations by USSD were terminated in July 1987 and site demolition (including the paint booths and stacks) occurred in 1988 and 1989. Because of the termination of USSD site activity, there is no current exposure pathway or potential for release to outdoor air from this facility.

Current Human Exposures Under Control
Environmental Indicator (EI) RCRIS code (CA725)

3. Are there complete pathways between "contamination" and human receptors such that exposures can be reasonably expected under the current (land- and groundwater-use) conditions?

Summary Exposure Pathway Evaluation Table

Potential **Human Receptors** (Under Current Conditions)

"Contaminated Media"	Residents	Workers	Daycare	Construction	Trespassers	Recreation	Food[3]
Groundwater							
Air (indoors)							
Soil (surface, e.g., <2 ft)							
Surface Water							
Sediment							
Soil (subsurface e.g., >2 ft)							
Air (outdoors)							

Instructions for Summary Exposure Pathway Evaluation Table:

1. Strikeout specific Media including Human Receptors -- spaces for Media, which are not "contaminated" as identified in #2 above.
2. Enter "yes" or "no" for potential "completeness" under each "Contaminated" Media – Human Receptor combination (Pathway).

Note: In order to focus the evaluation to the most probable combinations, some potential "Contaminated" Media – Human Receptor combinations (Pathways) do not have check spaces ("_____"). While these combinations may not be probable in most situations, they may be possible in some settings and should be added as necessary.

_____ If no (pathways are not complete for any contaminated media –receptor combination) – skip to #6, and enter "YE" status code, after explaining and/or referencing condition(s) in-place, whether natural or man-made, preventing a complete exposure pathway from each contaminated medium (e.g., use optional Pathway Evaluation Work Sheet) to analyze major pathways.

_____ If yes (pathways are complete for any "Contaminated" Media – Human Receptor combination) – continue after providing supporting explanation.

_____ If unknown (for any "Contaminated" Media – Human Receptor combination) – skip to #6 and enter "IN" status code.

Rationale and Reference(s):

No rationale warranted.

[3] Indirect Pathway/Receptor (e.g., vegetables, fruits, crops, meat and dairy products, fish, shellfish, etc.)

Current Human Exposures Under Control
Environmental Indicator (EI) RCRIS code (CA725)

4. Can the **exposures** from any of the complete pathways identified in #3 be reasonably expected to be **"significant"** (i.e., potentially[4] " unacceptable" levels) because exposures can be reasonably expected to be: 1) greater in magnitude (intensity, frequency and/or duration) than assumed in the derivation of the acceptable "levels" (used to identify the "contamination"); or 2) the combination of exposure magnitude (perhaps even though low) and contaminant concentrations (which may be substantially above the acceptable "levels") could result in greater than acceptable risks)?

_____ If no (exposures (can not be reasonably expected to be significant (i.e., potentially "unacceptable") for any complete exposure pathway) – skip to #6 and enter "YE" status code after explaining and/or referencing documentation justifying why the exposures (from each of the complete pathways) to "contamination" (identified in #3) are not expected to be "significant."

_____ If yes (exposures could be reasonably expected to be "significant" (i.e., potentially "unacceptable") for any complete exposure pathway) – continue after providing a description (of each potentially "unacceptable" exposure pathway) and explaining and/or referencing documentation justifying why the exposures (from each of the remaining complete pathways) to "contamination" (identified in #3) are not expected to be "significant."

_____ If unknown (for any complete pathway) – skip to #6 and enter "IN" status code.

Rationale and Reference(s):

No rationale warranted.

[4] If there is any question on whether the identified exposures are "significant' (i.e., potentially "unacceptable") consult a Human Health Risk Assessment specialist with appropriate education, training and experience.

Current Human Exposures Under Control
Environmental Indicator (EI) RCRIS code (CA725)

5. Can the "significant" **exposures** (identified in #4) be shown to be within **acceptable** limits?

_____ If yes (all "significant" exposures have been shown to be within acceptable limits) – continue and enter a "YE" after summarizing and referencing documentation justifying why all "significant" exposures to "contamination" are within acceptable limits (e.g., a site-specific Human Health Risk Assessment).

_____ If no (there are current exposures that can be reasonably expected to be "unacceptable") – continue and enter a "NO" status code after providing a description of each potentially "unacceptable" exposure.

_____ If unknown (for any potentially "unacceptable" exposure) – continue and enter "IN" status code.

Rationale and Reference(s):

No rationale warranted.

Current Human Exposures Under Control
Environmental Indicator (EI) RCRIS code (CA725)

6. Check the appropriate RCRIS status codes for the Current Human Exposures Under Control EI event code (CA725), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (and attach appropriate supporting documentation as well as a map of the facility):

_____ YE – Yes, "Current Human Exposures Under Control" has been verified.

_____ NO – "Current Human Exposures" are NOT "Under Control."

X IN – More information is needed to make a determination.

Completed by: (signature) _____ Date _____

(print) _____

(title) _____

Supervisor: (signature) _____ Date _____

(print) _____

(title) _____

(EPA Region or State) _____

Locations where References may be found:

USEPA documents referenced herein can be found at USEPA's Region III office in Philadelphia, PA. PADEP files obtained from the Southwest Regional office (SWRO) in Pittsburgh, PA are provided in pdf format on CD in Appendix A of the EI Report to which this checklist is also an Appendix (C). Additional documents may be located at the PADEP SWRO.

Contact telephone and e-mail numbers:

(name) _____

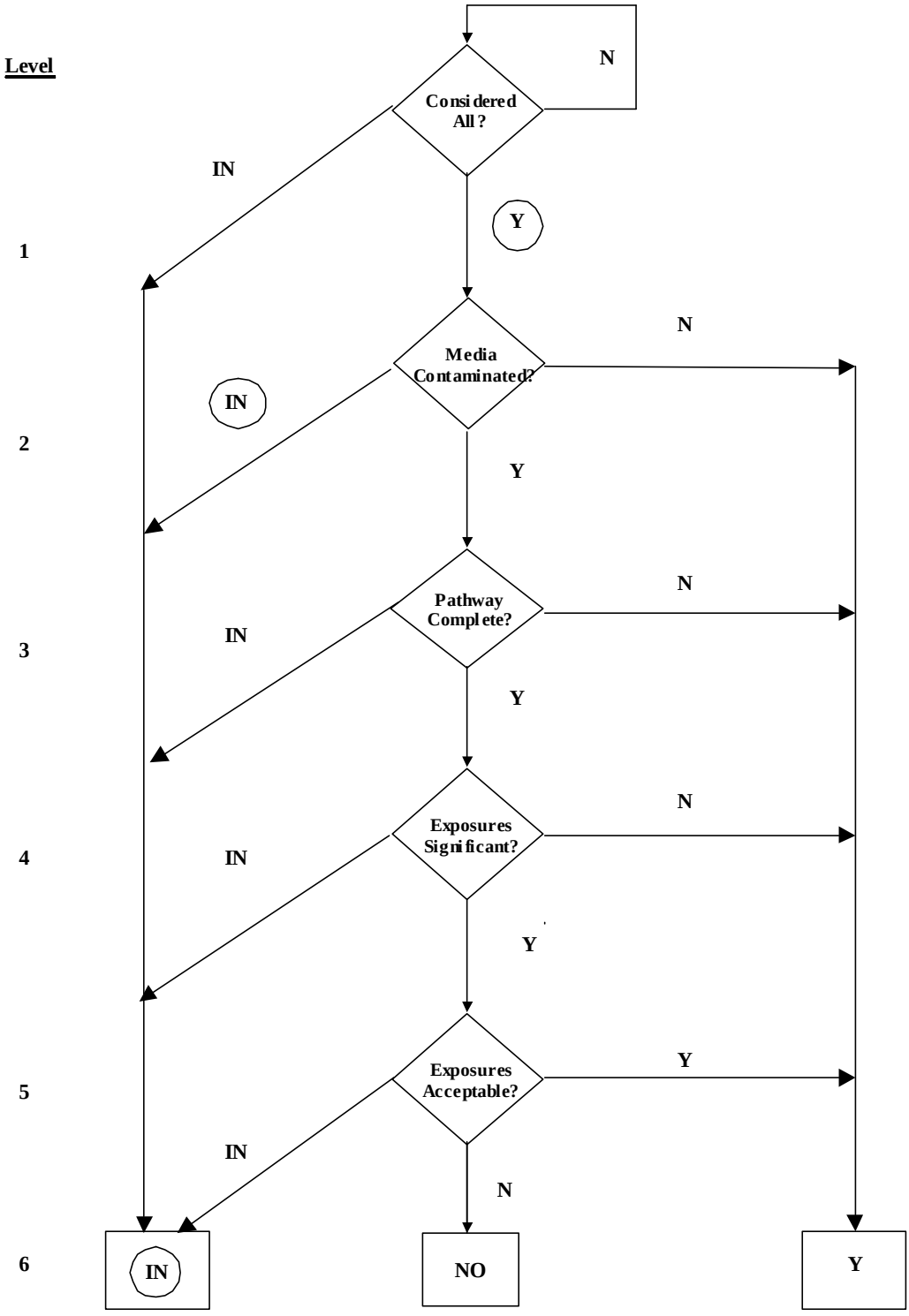
(phone #) _____

(e-mail) _____

_____

FINAL NOTE: THE HUMAN EXPOSURES EI IS A QUALITATIVE SCREENING OF EXPOSURES AND THE DETERMINATIONS WITHIN THIS DOCUMENT SHOULD NOT BE USED AS THE SOLE BASIS FOR RESTRICTING THE SCOPE OF MORE DETAILED (E.G., SITE-SPECIFIC) ASSESSMENTS OF RISK.

CURRENT HUMAN EXPOSURES UNDER CONTROL (CA 725)



EVALUATING THE VAPOR INTRUSION TO INDOOR AIR PATHWAY
Primary Screening – Question #1

Q1: Are chemicals of sufficient volatility and toxicity (Table 1) known or reasonably suspected to be present in subsurface soils, soil gas, or ground water; the presence of these chemicals having resulted from releases subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), or Areas of Concern (AOC))?

_____ If YES - check here, check the relevant chemicals on Table 1, and continue with Question 2 below;

_____ If NO - check here, provide rationale and references below, and skip to the Pathway-Specific EI Summary Page and document that the subsurface vapor to indoor air pathway is incomplete; or

__X__ If sufficient data are not available, skip to the Pathway-Specific EI Summary Page and enter "IN" (more information needed) status code.

Criteria:

Table 1 provides a list of chemicals and indicates whether they are sufficiently volatile and toxic to pose an incremental lifetime cancer risk greater than 10^{-5} or a hazard index (HI) greater than 1, assuming continuous exposure to the maximum possible vapor concentration. This is an extremely conservative criterion, corresponding to an infinite supply of the pure chemical (e.g., NAPL pool), and no indoor air dilution, which is highly unlikely to occur. The exposure assumptions and calculations are documented in Appendix B.

Note: Table 1 may not include all possible chemicals of concern; it can be revised to include other chemicals according to the methods described in Appendix B, if the necessary chemical property and toxicity data is available.

Rationale and References:

Figures, tables, and superscript references cited herein apply to those items presented in the EI report to which this checklist is an appendix. Additionally, acronyms applied in the following checklist responses are defined in the "Glossary of Acronyms" in the EI Report to which this checklist is an appendix

The USSD facility operations were previously assessed by NUS Corporation as part of USEPA Contract No. 68-01-7346. A Site visit was conducted by NUS personnel on May 18, 1989, and, in accordance with Technical Directive Document No. F3-8903-69, the resulting Environmental Priorities Initiative PAR[(71)] was issued on October 24, 1989. URS was contracted by PADEP to gather relevant information to complete this current EI assessment. To complete this SOW, URS has conducted an extensive records search at the PADEP SWRO. In addition, records acquired from the USEPA Region III Philadelphia Office via PADEP were reviewed and a site visit was conducted on November 6, 2008, at the former USSD location.

Former Spray Paint Booths: Four spray paint booths were used at the Site from approximately 1970 until July 1987 to paint products prior to shipment. Waste paint from the spray booths was washed into a 600-gallon tank that was used to precipitate paint. Paint sludge from the precipitate tank was removed and place in 55-gallon drums for disposal. Approximately 30 drums of waste paint sludge, eight drums of paint residue (containing lead and xylene) and four drums of air filters (holding leaded paint) per year were generated from the spray paint booths. The spray paint booths were demolished in 1989 following Parkway Union Development Corporation's (PUDC) purchase of the property in January 1988. The impact the activities in this building may have had (past or present) on Site environmental media, including groundwater, is unknown.

There has been no investigation to date of Site groundwater to include the breadth of constituents that would be necessary to evaluate possible spray booth-related impacts. Groundwater present within 100 feet (the radius specified by USEPA and PAEP for consideration of the vapor intrusion pathway) of current buildings may be impacted by the former spray paint booths, thus necessitating subsequent evaluation of potential impacts to indoor air via vapor intrusion. Also, future construction of new buildings in the former paint booth area, though nor currently planned, could place a structure within 100 feet of potentially-contaminated former paint booth soils, another possible vapor source.

Former Metal-Plating Facility: The metal plating facility operated from the mid-1960s until July 1987and was the location of plating of steel, aluminum, brass, copper, and bronze using various electrical and mechanical components of railroad signaling and control systems occurred following cleaning of the parts using an alkaline base wash, sulfuric and muriatic acids. Trichloroethene (TCE) was used as a degreasing agent. High levels of chromium, cadmium, copper, zinc, and aluminum metals were used in the plating baths. Plating bath sludges and spent TCE were drummed and held at the hazardous waste storage pad until disposal. Approximately 24 drums of treatment sludge, 25 drums spent bath material and six drums of plating bath sludge were generated each year. Prior to November 1980 a Hazardous Waste Storage Area was located east of the metal-plating facility before it was moved west of Building #56. The metal-plating facility was demolished after PUDC purchased the property in January 1988. The impact that these activities in this building may have had (past or present) on the site environmental media, including soil and groundwater, is unknown.

Former Hazardous Waste Storage Pad: The hazardous waste storage pad was a 1,950-square foot concrete pad located west of Building #56 used to store all drummed hazardous waste generated by USSD. Stored waste included paint booth waste, metal-plating wastes, metal heat treatment wastes, spent TCE and small amounts of battery acid from vehicles used on-site. The pad was constructed in 1981 and closed with PADER approval in December 1987 before PUDC purchased the property. However, URS was unable to identify and review any analytical data associated with the closure of the pad. The impact the storage of waste may have had on the Site soil and groundwater is unknown.

Former UST Areas: During the decommissioning of the USSD site in 1987 and the construction of the Edgewood Towne Centre in 1988, 37 USTs were removed[72]. Removal of these tanks occurred prior to the PADER UST program that became effective in August 1989; therefore, no UST closure documents were filed. The size, location and content of these tanks are unknown based on available data. However, it is known that in the former paint booth area paint waste (containing lead and xylene) was collected in a 600-gallon tank. It is also known that TCE was used as a degreasing agent in the former metal plating facility and that several different plating baths containing high level of chromium, cadmium, copper, zinc, and aluminum were used at the former metal plating facility.

URS did not locate any soil or groundwater information in either USEPA or PADEP files. Because the concentrations of organic and inorganic constituents were not quantified, it is unknown whether they meet current PADEP Act 2 MSCs. Because the chemical quality of the soil and groundwater is unknown, it cannot be determined whether a current or future complete exposure pathway is present. The impact from these tanks (past or present) on the site environmental media is unknown.

Summary: While there have been no known documented releases or hazardous waste violations during the operational history of the facility, no soil, surface water or groundwater samples were collected to indicate that the chemicals listed in Table 2 of the EI Report were absent in site media at the time of closure. A detailed discussion of the Site history and operations has been presented on the "Current Human Exposures" Checklist and in the EI Report, to which this checklist is an appendix.

There are currently no controls on the indoor air pathways at the Site. It is unknown whether such controls are needed to mitigate the soil vapor/groundwater-to-indoor air pathway because there is no data available for the Site to determine if the pathway is complete. Further investigation of Site soils and groundwater would be needed to determine if the vapor intrusion to indoor air pathway is complete and, if so, to dictate possible implementation of controls such as deed restrictions on further buildings or engineering controls for existing buildings

EVALUATING THE VAPOR INTRUSION TO INDOOR AIR PATHWAY

Primary Screening – Question #2

Q2: Are inhabited buildings located near subsurface contaminants having sufficient volatility and toxicity?

_____ If YES - check here, identify buildings below, and continue with Question 3 below.

_____ If NO – check here and skip to the Pathway-Specific EI Summary Page and document that the subsurface vapor to indoor air pathway is incomplete, or

_____ If sufficient data are not available - check here and skip to Pathway-Specific EI Summary Page and enter "IN" (more information needed) status code.

Criteria:

The goal of this question is to identify buildings that could potentially have a complete pathway, i.e., indoor air concentrations above levels that would pose a lifetime incremental cancer risk of 10^{-5}, or a hazard index of >1. For the purposes of this question:

- **"inhabited buildings"** are structures with enclosed air space that are designed for human occupancy.
- **"subsurface contaminants having sufficient volatility and toxicity"** are defined by Table 1 and were discussed above in Question 1.
- An inhabited building is considered **"near"** subsurface contaminants if it is located within 100 ft laterally of known or interpolated soil gas or groundwater concentrations in excess of the criteria in Table 2.

A distance criterion is necessary to focus the assessment on buildings most likely to have a complete pathway. Vapor concentrations generally decrease with increasing distance away from a subsurface vapor source, and at some distance, the concentrations become negligible. The distance at which concentrations are negligible is a function of the mobility, toxicity and persistence of the chemical, as well as the geometry of the source, subsurface materials, and characteristics of the building of concern. Definitive studies on this topic have yet to be conducted, but 100 feet is a reasonable criterion when considering vapor migration fundamentals, typical sampling density, and uncertainty in defining the actual contaminant spatial distribution.

Identify Inhabited Buildings Within Distances of Possible Concern:

Not applicable.

EVALUATING THE VAPOR INTRUSION TO INDOOR AIR PATHWAY
Primary Screening Stage-– Question #3

Q3. Is **immediate action warranted** to mitigate current risks to residents of those buildings identified in Question 2 to be located within the area of concern?

_____ If YES – check here and proceed with immediate actions to verify or eliminate imminent risks, which may include indoor air quality monitoring, engineered containment or ventilation systems, or relocation of receptors[1]. The immediate action(s) should be appropriate for the situation.

_____ If NO – check here and then continue with Question 4 below.

Criteria:
Here we focus on those buildings identified in Question 2 to be located within the areas of concern. The following qualitative criteria are considered sufficient to justify immediate actions:

Odors reported by occupants, particularly if described as "chemical", or "solvent", or "gasoline". The presence of odors does not necessarily correspond to adverse health and/or safety impacts and the odors could be the result of indoor vapor sources; however, it is prudent to investigate any reports of odors as the odor threshold for some chemicals exceeds their respective acceptable target breathing zone concentrations.

Physiological effects reported by occupants (dizziness, nausea, vomiting, confusion, etc.).

Wet basements, in areas where chemicals of sufficient volatility and toxicity (see Table 1) are known to be present in groundwater and the water table is shallow enough that the basements are prone to groundwater intrusion or flooding, especially if there is evidence of light, non-aqueous phase liquids (LNAPLs) floating on the water table directly below the building, and/or any direct evidence of contamination (liquid chemical or dissolved in water) inside the building.

Short-term safety concerns are known, or are reasonably suspected to exist - for example: a) explosive or acutely toxic concentrations of vapors have been measured in the building or connected utility conduits; b) explosive or acutely toxic levels of vapors are likely to be present in utility conduits, sumps, or other subsurface drains directly connected to the building. Lower explosive limits are typically in the range of 1 to 5% by volume (10,000,000 ppbv to 50,000,000 ppbv).

There may be circumstances in which the Responsible Party elects to initiate indoor air quality monitoring and/or pro-actively eliminate exposures through avoidance or mechanical systems, rather than pursue continued assessment of the pathway. In some cases this may be a cost-effective option as it leads directly to an incomplete subsurface vapor to indoor air pathway. This option is available at any time in the assessment. Furthermore, some buildings are positively pressurized as an inherent design of the heating, ventilating and air conditioning system, and it may be possible to show that the pathway is incomplete by demonstrating a significant pressure differential from the building to the subsurface. Proactive indoor air quality monitoring may also be initiated at any time, although it is not necessary if the pathway can be confirmed to be incomplete using other data.

Rationale and Reference(s):

No rationale warranted.

EVALUATING THE VAPOR INTRUSION TO INDOOR AIR PATHWAY
Secondary Screening – Question #4

Q4: Do measured or reasonably estimated indoor air, soil gas, or ground water concentrations[2] exceed the target media-specific concentrations given in Table 2?

_____ If NO, and there is no reason to believe that the conservative attenuation factor of 0.01 is inappropriate – document representative media concentrations on Table 2 and check here. Go to the Pathway-Specific EI Summary Page and document that the subsurface vapor to indoor air pathway is incomplete. *See justification presented in Q3 based on PADEP VIP Guidance.

_____ If YES – check here. If indoor air concentrations are known and these are greater than the target indoor air concentrations, then the pathway is complete and engineering controls or avoidance measures need to be implemented. If only soil gas or groundwater data are available, and these exceed the target criteria, document representative media concentrations on Table 2 and then proceed to Question 5.

_____ If sufficient data are not available - check here and skip to Pathway-Specific EI Summary Page and enter "IN" (more information needed) status code.

Criteria:
Question 4 is intended to allow a rapid screening of available site data, which may include soil gas, groundwater, or indoor air concentrations. Concentrations in the three media are assumed to be correlated, so that data from any of the three media can be used. If data are available for more than one media, all of the data should be considered in answering Question 4. As discussed in Appendix A, confidence in the assessment increases with multiple lines of evidence, so additional data may be collected for consideration in Question 4, at the discretion of either the responsible party or the lead regulatory authority, to the extent that this may be necessary and appropriate.

Note that it is important to segregate the buildings of interest into two categories: a) buildings lying above areas where contaminated groundwater is the only source of contaminant vapors, and b) buildings lying above areas where contaminated vadose (unsaturated) zone vapor sources are present. While indoor air quality data can be used to judge the pathway completeness in either case, the appropriate use of groundwater and soil gas data is different for these two cases. In case (a) either the soil gas or groundwater criteria in Table 2 can be used at this step, while in case (b) only soil gas criteria and soil gas samples collected above the vapor source zone can be used. This is because the groundwater criteria have been derived assuming no other vapor sources between the water table and the building foundation. This also applies for Question 5.

The term "measured or reasonably estimated" is used above (and throughout this document) as it is recognized that measurements at all buildings of concern may not be practical or necessary. For example, groundwater concentrations beneath buildings are commonly estimated from concentrations collected in wells distributed about a larger area of interest. Likewise, one might reasonably estimate upper bound indoor air concentrations for a group of buildings based on the measurements taken from those buildings expected to have the highest concentrations.

In the case of soil gas concentrations, measured or reasonably estimated soil gas concentrations at any depth in the subsurface may be used in Question 4, provided that this depth falls below the foundation depth. As there are concerns about the integrity of shallow soil gas samples, it is recommended that samples collected at depths <5 ft below ground surface (BGS) not be used for this analysis, unless they are collected immediately below the building foundation several feet in from the edge. Samples from fixed probes are also preferable, but not required. With respect to the spatial distribution of sampling points, close proximity to the building(s) of concern is preferred; however, it may be possible to reasonably estimate concentrations based on data from soil gas samples collected about a larger area. Users should

also consider that, in general, samples collected at depth closer to the vapor source are much less likely to be dependent on the surface cover (i.e. pavement, lawn, foundation) than shallow soil gas samples. In the case of groundwater concentrations, these should be measured or reasonably estimated using samples collected from wells screened at, or across the top of the water table. This is necessary to be consistent with the derivation of the target groundwater criteria in Table 2. Samples from groundwater monitoring wells may be a blend of groundwater from different levels across the screened interval. Confidence in the results can be increased through use of a more narrowly screened interval across the water table, or a variety of other depth-discrete sampling protocols. These issues, and others to be considered during data collection, are discussed in Appendix A.

Question 4 calls for comparison with the target criteria given in Table 2; however, this guidance is not intended to supercede existing state-specific guidance or regulations. Thus, the lead regulatory agency will determine the appropriate criteria to be used here and in Questions 5 and 6. If target criteria are not available, then the tables provided with this guidance should be used. A regulatory agency may have already developed acceptable indoor air concentrations, but they might not have derived vapor intrusion pathway-specific target media concentrations. In this case, the methods discussed in Appendix B can still be used to derive target soil gas and dissolved groundwater concentrations consistent with those existing target indoor air concentrations. Where pathway-specific media concentrations already exist, the values provided in this guidance should be considered national benchmarks, and the governing regulatory authority should compare the methods and assumptions used to derive their criteria with the methods used in this guidance. In any case, users of this guidance should review the methods used to derive the tables presented in this guidance, and consider whether or not the assumptions and methods are appropriate for their application. These assumptions are discussed briefly below, and in more detail in Appendix B. The target media-specific concentrations given in Table 2 correspond to indoor air concentrations calculated to cause an incremental lifetime cancer risk of 10^{-5} or a Hazard Index of 1.0 (whichever is more restrictive). In the case of the soil gas criteria, a conservative soil gas to indoor air attenuation factor of 0.01 is used. For the groundwater criteria, there is an additional conservative assumption that the partitioning of chemicals between groundwater and soil vapor is assumed to obey Henry's Law. Table 2 may not include all possible chemicals of concern; it can be revised to include other chemicals of concern according to the methods described in Appendix B, if chemical property and toxicity data is available.

The soil gas to indoor air attenuation factor represents the ratio of the indoor air concentration to the soil gas concentration at some depth. The 0.01 value is considered to be a reasonable upper-bound value for the case where the soil gas concentration immediately beneath a foundation is used (e.g., the indoor air concentration would not be expected to exceed 1/100 of the concentration immediately below the foundation). This value is based on available data from sites where paired indoor air and soil gas samples immediately below a foundation were available, and also theoretical considerations. It is a conservative enough criterion that it should be protective even in settings where the building has significant openings to the subsurface. In addition, since it has been argued that the 0.01 value is conservative for deriving near foundation soil gas criteria, the soil gas criteria derived using this value would be even more conservative if applied to soil gas concentrations measured or reasonably estimated at any other deeper depth. For reference, attenuation factors as low as 0.00001 have been determined from data at some sites. There may be some settings where the 0.01 attenuation factor is not a conservative upper-bound value; however, most of these settings would presumably be identified and addressed in Question #3.

The authors of this guidance felt that the uncertainties associated with soil partitioning calculations as well as the uncertainties associated with soil sampling and soil chemical analyses (see EPA/600/SR-93/140) were so great that use of soil concentrations for assessment of this pathway is not technically defensible. Thus, soil concentration criteria were not derived and the use of soil criteria is not encouraged. However, as discussed above, this guidance is not intended to supercede existing State guidance, and users should follow the appropriate guidance as determined by the lead regulatory authority. Furthermore, proponents may elect to defend the use of soil concentration data in the Site-Specific Pathway Assessment, Question 6.

EVALUATING THE VAPOR INTRUSION TO INDOOR AIR PATHWAY

The soil gas and groundwater target concentrations were derived from the target indoor air criteria, without consideration of ambient outdoor air quality or other chemical sources internal to the building. The target concentrations should therefore be interpreted as target incremental concentrations above background levels. To be consistent with that definition, background concentrations should be subtracted from measured or reasonably estimated indoor air concentrations before comparison against the Table 2 (or other appropriate) criteria.

Values appearing in Table 2 were derived for an incremental lifetime cancer risk (R) of 1×10^{-5} and hazard index (HI) of 1. The risk-manager or decision-maker should consider a number of variables when comparing site data to the Table 2 criteria, including: the number and locations of samples, the spatial and temporal variability of concentrations, the frequencies of accedences of Table 2 criteria, the magnitude of accedences of Table 2 criteria, and the degree of conservatism built into Table 2 values. The Table 2 criteria are not intended for use as "bright-line criteria", below which any measured or reasonably estimated concentrations are acceptable and above which any concentrations are unacceptable. Instead, professional judgment should be used when applying the criteria. For example, if eight out of ten samples satisfy Table 2 criteria and the other two exceed the criteria, but only by a factor of two or three, the risk-manager might decide that the pathway is incomplete, even though two of the samples exceed the criteria. This is because the risk estimate is still in the same order-of-magnitude as the target risk level and there is some conservatism built into the Table 2 values.

Rationale and Reference(s):

No rationale warranted.

EVALUATING THE VAPOR INTRUSION TO INDOOR AIR PATHWAY
Secondary Screening – Question #5

Q5: Using the appropriate scenario-specific attenuation factor (from Figure 1), do measured or reasonably estimated soil gas or ground water concentrations exceed the target media-specific concentrations given in Table 3?

_____ If NO, and there is no reason to believe that the scenario-specific attenuation factor is inappropriate, check here and document the Rationale and References for the scenario-specific attenuation coefficient below. Go to the Pathway-Specific EI Summary Page and document that the subsurface vapor to indoor air pathway is incomplete.

_____ If YES – check here, and if representative measured or reasonably estimated soil gas and/or groundwater concentrations are considerably (i.e. greater than 100 times) higher than the values in Table 3 then interim exposure controls and/or measurement of indoor air quality monitoring should be conducted as soon as practicable; and when representative media concentrations are less than 100 times the appropriate Table 3 values proceed to further analysis and modeling in Question 6.

_____ If sufficient data are not available - check here and skip to Pathway-Specific EI Summary Page and enter "IN" (more information needed) status code.

Criteria:
Soil gas or groundwater to indoor air attenuation factors are expected to depend on building characteristics, chemical type, soil type, and depth of the source (which is defined as either a measured soil gas concentration at the specified sample collection depth below the building, or the ground water concentration at the depth of the water table). The 0.01 attenuation factor value used in Question 4 is representative of expected upper bound values for vapors located immediately below the building, and therefore does not depend on soil type or depth. Question 5 considers the site-specific soil type and depth of source to allow for a more representative vapor attenuation factor, and consequently the target media concentrations. The target indoor air concentrations remain the same (unchanged from Table 2), but target soil gas and groundwater concentrations will vary with changes in the vapor attenuation factor.

Attenuation factors have been calculated for some combinations of source depth, soil type, and building characteristics using the Johnson and Ettinger (1991) model. Reasonable building characteristics were selected and held constant in these calculations and the chemicals were assumed not to degrade. To capture the effect of changes in soil properties, the U.S. Soil Conservation Service (SCS) soil texture classifications were considered, and a subset of these were selected. This subset was chosen so that their relevant properties (porosity and moisture content) would collectively span the range of conditions most commonly encountered in the field. Then, plots of attenuation factor vs. depth were calculated and these results are presented below in Graphs 1a (for use of soil gas data) and 1b (for use of groundwater data). The two graphs are different because the first does not have to account for transport across the capillary fringe. Details of these calculations are included in Appendix B.

The depth used should be: a) the vertical separation between the soil gas sampling point and the building foundation for use of Graph 1a, or b) the vertical separation between groundwater and the building foundation for use of Graph 1b. Samples collected near to, but at depths shallower than the building foundation should not be used. Table 4 should be used to help select the most appropriate soil texture classification as discussed below.

The site characterization should include collection of soil samples at various depths between the building foundation elevation and contamination source (i.e., vertical soil gas and/or groundwater quality profiling) and description of soil lithology. The preferred method for determining the SCS soil class is to use lithological information combined with the results of grain size distribution tests on selected soil samples. Procedures for conducting grain size distribution tests are provided in American Society for Testing and Materials (ASTM) Standard Test Method for Particle Size Analysis of Soils (D422-63) and U.S. Natural

Resources Conservation (NRCC) Soil Survey Laboratory Methods Manual, Soil Survey Laboratory Investigations Report No. 42.

The U.S. SCS soil texture classes are based on the proportionate distribution of sand, silt and clay sized particles in soil. It does not include any organic matter. The grain size boundaries are as follows:

Sand: 0.05 mm to 2 mm
Silt: 0.002 mm to 0.05 mm
Clay: <0.002 mm

The soil textural classes are displayed in the SCS soil textural triangle. The soil texture class is determined by plotting the grain size distribution results on the soil texture triangle. If a soil texture class is not intersected based on the five classes included in the guidance, the nearest soil class is chosen. The selection of the soil texture class should be biased towards the coarsest soil type of significance, as determined by the site characterization program.

There are sites where different soil classifications systems have been used, and where information on soil lithology and grain size distribution is limited. Most engineering soil classification systems are either based on grain size, or a combination of grain size and engineering properties (e.g., Unified Soil Classification System (USCS), ASTM D2488-84, NAVFAC DM7.2 (1982)). For several soil classification systems, soil is divided into a coarse-grained fraction consisting of sand and gravel (or larger) particles (greater than 0.075 mm size) and fine-grained fraction consisting of silt and clay (less than 0.075 mm size). Soils are characterized as fine-grained if more than 50 percent is less than 0.075 mm in size. Various descriptors of particle size proportions such as trace, few, little, some, or use of the grain size class as an adjective or noun are often used to describe different soil types. In some cases engineering properties are also used to determine the appropriate soil type description. Unfortunately, there are widespread differences in both the soil classification systems used to describe soils and differences in the quality of lithological descriptions incorporated in boring logs.

To assist users of guidance in cases where lithological and grain size information is limited, Table 4 below provides guidance that can be used to select, in appropriate terms, the appropriate soil texture class. Table 4. Guidance for selection of soil type curves in Graphs 1a and 1b.

If your boring log indicates that the following materials are the predominant soil types …	Then you should use the following texture classification when obtaining the attenuation factor
Sand or Gravel or Sand and Gravel, with less than about 12 % fines, where “fines” are smaller than 0.075 mm in size.	Sand
Sand or Silty Sand, with about 12 % to 25 % fines	Loamy Sand
Silty Sand, with about 20 % to 50 % fines	Sandy Loam
Silt and Sand or Silty Sand or Clayey, Silty Sand or Clayey, Sandy Silt, with about 45 to 75 % fines Sandy Silt or	Loam
Sandy Silt or Silt, with about 50 to 85 % fines	Silt Loam

We note that there is no soil texture class represented as consisting primarily of clay. Exclusion of clay was deliberate since homogenous, unfractured clay deposits are rare. Users of this guidance have the option to refine selection of soil properties as part of the Site Specific Pathway Assessment.

The user must defend their scenario choice with site-specific data. Given the approximate nature of this approach, users should round their attenuation factor to the nearest half order-of-magnitude (0.01, 0.003, 0.001, 0.0003, or 0.0001), selecting the higher number if the best estimate is between two increments. Then, the columns in Table 3 can be used to determine the appropriate target media concentrations. Values in Table 3 were derived as discussed in Appendix B.

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Interim exposure controls and/or measurement of indoor air quality should be conducted as soon as practicable if measured or reasonably estimated soil gas and/or groundwater concentrations are considerably (i.e. greater than 100 times) higher than the values in Table 3 since the Site-Specific Assessment step is very unlikely to result in an attenuation factor that is 100 times smaller than the attenuation factor determined at this stage. This is especially true for any chemical (degradable or not) when shallow (e.g., <2 ft beneath the building foundation) soil gas concentrations are being used for assessment.

If the media concentrations being used are from a significant depth and the chemicals of concern are known to degrade aerobically, it is possible for the actual attenuation factor to be considerably less than the value determined in this step. However, this issue should be addressed through vertical soil gas profile sampling involving shallower samples in this question (or other direct empirical evidence and supporting data to show the profile of oxygen, carbon dioxide, or other indicators of microbial activity are adequate to validate conceptual models based on analogous case studies in similar settings, in Question 6). Again, if shallow soil gas samples are being used, it is unlikely that degradation will contribute significantly to increased attenuation between the sampling point and the building. It should also be recognized that it may be less expensive (or more desirable for other reasons) to install and operate exposure controls than to conduct further assessment. This guidance neither requires nor precludes such an approach, and it is left to the discretion of the responsible party to decide if proactive exposure controls are cost-effective.

Rationale for Selecting Site-Specific Attenuation Factor and Reference(s):

No rationale warranted.

EVALUATING THE VAPOR INTRUSION TO INDOOR AIR PATHWAY
Site-Specific Assessment – Question 6

Q6: Do measured or reasonably estimated soil gas or ground water concentrations exceed media-specific criteria developed specifically for this site?

_____ If YES - check here and implement exposure controls (avoidance or mechanical systems with appropriate monitoring to demonstrate their effectiveness) to prevent possible human exposures to subsurface vapors migrating into indoor air. Prepare a performance monitoring plan and proceed to Question 7;
_____ If NO – check here and provide documentation of Site-Specific Assessment for regulatory review.
_____ If sufficient data are not available - check here and skip to Pathway-Specific EI Summary Page and enter "IN" (more information needed) status code.

Criteria:
The Site-Specific Pathway Assessment is intended to be used where site-specific conditions warrant further consideration prior to concluding either that the pathway is incomplete, or that some form of exposure control is required. The assessment could be as simple as using the same equations employed to develop the Secondary Screening criteria but with revised inputs that are defended with site-specific data. It could also be as complex as a comprehensive mapping of subsurface vapor distributions and measurement of subsurface material properties affecting gas flow and transport, combined with the development of a site-specific vapor transport model. The data needs are greater here than in the Primary and Secondary Screening; however, the necessary data might already be available from previous site characterization work.
A conceptual model of the site and subsurface vapor transport and vapor intrusion mechanisms will be needed to defend the Site-Specific Pathway Assessment. Model inputs and assumptions that are different than the generic assumptions in Questions 4 and 5 criteria (and others to be added to the appendices) must be supported with site-specific data.
The site-specific conceptual model should be developed in the source-pathway-receptor framework, and it should identify how the site-specific conceptual model is similar to, and different from, the generic conceptual model used in developing Table 3. Key components of the conceptual model may need to be justified with site-specific data, including, but not limited to the source (chemical constituents, concentrations, mass, phase distribution, depth, and aerial extent), pathway (soil texture, moisture, and layering) and receptor (building design, construction, and ventilation). The indoor air concentrations may be simulated with a mathematical model, which the user must be prepared to document and defend as appropriate for the site-specific conceptual model. The user must also defend model inputs (different than those (to be added to) the appendices) by validated site-specific data. The discussion above in Appendix A concerning data sufficiency is also applicable here. Indoor air quality sampling and analysis is neither required, nor precluded; however, if indirect data (e.g. soil gas data) are to be used exclusive of indoor air quality data, the vapor attenuation factor must be assigned either using site-specific data (e.g. the building ventilation rate, pressure differentials, soil gas permeability), or using conservative assumptions.
If the pathway is not judged to be incomplete during the Primary, Secondary, or Site-Specific Screening, it is considered to be complete, unless some action is taken. Possible actions include:

- engineered containment systems (subslab de-pressurization, soil vacuum extraction, vapor barriers)
- ventilation systems (building pressurization, indoor air purifiers)
- avoidance (temporary or permanent receptor relocation) or
- removal actions to reduce the mass and concentrations of subsurface chemicals to acceptable levels (i.e., remediation efforts).

Rationale and Reference(s):

No rationale warranted.

EVALUATING THE VAPOR INTRUSION TO INDOOR AIR PATHWAY
Post-Assessment Monitoring – Question 7

Q7: Will temporal monitoring data or performance monitoring data (for a mechanical exposure control system) be collected to assess whether the pathway remains incomplete?

_____ If YES - check here and provide a brief summary of the monitoring requirements, or reference monitoring workplan.
_____ If NO – check here and provide justification.

Criteria:
Performance Monitoring is necessary to ensure that the pathway remains incomplete for sites relying on exposure control systems. **Pathway Monitoring** is recommended for sites where the measured or reasonably estimated media concentrations are at, or marginally less than the target media concentrations for that site, or when temporal trends cannot be reasonably predicted with existing data. This could involve repeated sampling of groundwater, soil gas, or indoor air on some appropriate frequency. The need for pathway monitoring is decided by the lead regulatory authority; however, one should consider the derivation of the target media concentrations and differences between those and measured or reasonably estimated values when determining monitoring requirements. Presumably, monitoring is less important in cases where measured or reasonably estimated media concentrations are an order of magnitude less than the more conservative media criteria (Table 2), and monitoring is more important when measured or reasonably estimated media concentrations are only marginally less than criteria selected at Question 5 (Table 3) or Question 6. As additional data becomes available, it should be compared with previous data as well as the target media-specific concentrations. If accedences occur, or are projected to occur, appropriate actions (usually engineering controls) should be taken, or continued. If monitoring demonstrates that the pathway is incomplete and will remain so under current site conditions, then other actions are not necessary.

Rationale and Reference(s):

No rationale warranted.

EVALUATING THE VAPOR INTRUSION TO INDOOR AIR PATHWAY
Pathway-Specific EI Summary Page

Facility Name:	Former Union Switch & Signal Division
Facility Address:	1789 South Braddock Avenue, Pittsburgh, Pennsylvania 15218
Facility EPA ID #:	PAD 000001115

Below, check the appropriate status codes for the Subsurface Vapor to Indoor Air Pathway evaluation on the EI determination and attach appropriate supporting documentation as well as a map of the facility.

Is there a Complete Pathway for subsurface vapor intrusion to indoor air?

	NO - the "Subsurface Vapor Intrusion to Indoor Air Pathway" has been verified to be incomplete.
	YE – Yes, The "Subsurface Vapor to Indoor Air Pathway" is Complete.
X	IN - More information is needed to make a determination.

Locations where References may be found:

USEPA documents referenced herein can be found at USEPA's Region III office in Philadelphia, PA. PADEP files obtained from the Southwest Regional office (SWRO) in Pittsburgh, PA are provided in pdf format on CD in Appendix A of the EI Report to which this checklist is also an Appendix (C). Additional documents may be located at the PADEP SWRO.

Contact telephone and e-mail numbers:

(name):

(phone #):

(e-mail):

This document is dedicated to the late Craig Mann, who was a member of the authoring committee, a prominent researcher in the field and programmer of the widely-used spreadsheet version of the Johnson and Ettinger (1991) model available at www.epa.gov/superfund/programs/risk/airmodel/johnson_ettinger.htm. He was a friend and inspiration to us all.

FINAL NOTE: THE HUMAN EXPOSURES EI IS A QUALITATIVE SCREENING OF EXPOSURES AND THE DETERMINATIONS WITHIN THIS DOCUMENT SHOULD NOT BE USED AS THE SOLE BASIS FOR RESTRICTING THE SCOPE OF MORE DETAILED (E.G., SITE-SPECIFIC) ASSESSMENTS OF RISK.